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Urban-Rural Migration under the devolved governance system in Kenya: Subsequent implications for income and occupation

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Abstract

The study investigates the impact of urban-rural migration on income and occupation. The paper aims to estimate the probabilities and significance of income and occupational change across different socio-economic characteristics and demographic profiles upon return to the rural areas from Nairobi city, particularly after the enactment of 2013 Kenya devolution policy. The paper draws upon exploratory research using data comprising 69 interviews with the return migrants after they had established a stay in rural areas, two years subsequently after migrating from Nairobi city. By applying the empirical methods of probit regression model, the study finds that significant probability for income change varies across different socio-economic attributes and demographic profiles. Occupational change and associated probabilities are significantly determined by low education level, female gender, the old age, huge rural land size, and low migrant's job-related expertise level. For both income and occupational change, rural land size more than 2.5 acres is a significant incentive for urban-rural migration; given the likelihood that return migrant shifts to agriculture and in a long run establishes a robust source of income. This, after assigning other dummy variables, and setting the baseline at two years.

Keywords: *Urban-rural migration, Kenya devolution policy, income and occupational change, Probit model.*

Introduction

The migration of people from Kenya's rural areas into Nairobi city is a common phenomenon. It's easy to find youngsters as old as 18 years moving to the cities upon their high school completion. Most of the youths are perhaps inspired by the perceived upward social mobility associated with city life. However, according to Mallach (2018), the desire to stay in the city depends on their long-term encounters such as poverty in these areas. People whose income improves significantly are likely to lead better lives, hence are willing to wait for more extended periods. On the other hand, individuals whose salaries are significantly low cannot afford necessities such as decent housing and healthy food. Such individuals have a lower incentive to stay in the city when they dreams of economic success are shattered as suggested by Mallach (2018). It is imperative for some of the urban migrants to return to the rural or less urbanised areas with a lower cost of living to take on agriculture and other rural economic activities. Studies such as Hernández-Murillo & Marifian (2013) and Leigh (2013) claim that industrialists prefer setting up their firms in highly populated areas to benefit from a ready market for their products and low distribution costs. As economic activities and industries grow, so does labour influx surges into those areas. Conversely, rural-urban migration can start with establishment of industries in a particular areas. Rural-urban migration follows as people flock to those areas to look for jobs (Tacoli, McGranahan & Satterthwaite, 2015). Then again, regardless of what comes first, development of various infrastructures tends to be more reasonable in urban areas to both the government and private stakeholders.

The rural-urban influx of low-income population is responsible for an upsurge in informal settlement in Nairobi city. Informal settlements in Kenya, such as Korogocho, Kibra, Mukuru Kwa Njenga, and Mathare, have sprawled within the city. Scholars such as Mahabir et al (2016) and Zulu et al. (2011) argue that those who opt to live in such setups compromise their housing way to sustain the costly city life. The informal settlements have their challenges, including the government's inability to supply basics such as water and amenities, especially critical infrastructure (Ajaero & Onokala, 2013). Since most housings in informal settlement areas are substandard, residents are often susceptible to catastrophes such as disease and fire outbreaks, which wreak havoc and even claim lives (Ernst, Phillips & Duncan, 2013). While staying in the city appears more meaningful to some urban dwellers, some rural-urban migrants, regardless of economic status, decide to return to the rural or less urbanised areas. This section of the migrants are perhaps perceived to be motivated by a lower cost of living and some rural economic opportunities according to Mallach (2018).

People's motivations to migrate from cities has been widely studied; however, little or no empirical study captures a clear picture concerning urban-rural migration following the enactment of Kenya's devolution policy. Data concerning the differences in decision-making across demographic profiles when urban-rural migration occurs is also scarce. In this study, there is a detailed look into the reasons for urban-rural migration, particularly from Nairobi city to rural or less urbanised places, emphasising the backdrop of opportunities or expectations across various demographic profiles and implications they carry forward in regard to income and occupational change. The research assesses these attributes in the Kenyan setup under the devolved system of governance. The study objectives are twofold 1) to estimate the probability and significance of income change upon urban-rural migration, 2) to assess the probability of occupational change upon migration to the rural area. Conclusions are made on the hypotheses results as well as way forward. To successfully assess the phenomenon, the research formulates two hypotheses;

1. $H_0$1: Significant probability for income change does not varies across different socio-economic attributes and demographic status;
2. $H_0$2: Significant probability for occupational change among returned migrants are not determined by low education level, female gender, the old age, huge rural land size, and low migrant's job-related expertise level.

These hypothesis were tested using probit regression model on the obtained 69 adult participants in the Republic of Kenya. The study first familiarises the reader with concepts and theories of urban-rural migration in literature review. It proceeds to test the collected data about the changes in income and occupation from the selected study sample. The study scope is period after the implementation of the devolution policy in Kenya.

Literature Review

Urbanisation, migration and industrialisation link is a widely debated topic. Studies such as Hernández-Murillo & Marifian (2013) and Leigh (2013) claim that industrialists prefer setting up their firms in highly populated areas to benefit from a ready market for their products and low distribution costs. As industries grow, so does the swarming of people into those areas, and this explains rural-urban migration. Conversely, the process can start with the establishment of industries in certain areas. Rural-urban migration follows as new waves of job seekers move to those areas (Tacoli, McGranahan & Satterthwaite, 2015). Then again, regardless of what comes first, development of various infrastructures tends to be more reasonable in urban areas to both the government and private stakeholders. Irrespective of what comes first, industrialisation influences migration significantly.

The devolution opportunities were augmented by the harmonisation of human resource policies improved workers' welfare, such as employment and salaries, regardless of residence in 2012. This suggests that salary could be determined by the job group rather than the region where the civil servant is placed. The harmonisation could inspire civil servants in the cities such as Nairobi to seek transfer to rural areas where they could save more. Also, having more people working in devolved governments is probable to redistribute income and expand markets. As more people who are economically empowered move to the rural areas, running businesses profitably becomes possible. Such investments spur further urban-rural migration as the economic balance between the cities, and the rural areas are achieved as per devolution goals. The research theorises that Pieterse (2013) 's harsh encounters and increasing available economic opportunities back at home, as suggested by Mueller & Thurlow (2019), given the enactment of devolution policy, inspire migration out of Nairobi city. Secondly, the study theorises that demographic profiles predict urban-rural migration, and there are significant changes in income and occupation among return migrants. Capturing key variables such as the demographics of those who migrate, the motivations for migration, and the impacts of the dynamics give a clear picture of the devolution policy's effectiveness.

The key facts coming out of the migration theories include people's tendency to perceive the urban areas as having more economic opportunities and reliance on this idea to make migration decisions. Also, the theories indicate that people can stick to certain areas, not because of the real but perceived positives relative to negatives, and conclusions about them might be biased. Thirdly, the tendency to migrate can be influenced by various factors such as gender. Each of these ideas can be affected by the adoption of devolved governance. GoK (2016) policy on the Devolved System of Government holds that a devolved governance system under the County Government Act of 2012 was formulated to even out social and economic development processes and provide proximate, easily-accessible public services in the country. This implies that the policy could generate more job opportunities and income in the rural areas, and thus, act as an incentive for urban-rural migration.

Multiple theories have been proposed to explain migration and its associated concepts. The dual-sector model by Arthur Lewis introduces the concepts of about market dichotomy. According Gollin (2014), Lewis claims that two labour market categories exist; primary and secondary sector. The demand for labour force in the urban sector relative to the rural one implies more opportunities and higher wage rates in the urban sector, which encourages migration to more urbanised areas. In light of this, migration from rural areas, especially among the Kenyan youth, is considered an avenue to escape poverty since payment for their labour is higher in the urban centres (Mberu, Béguy & Ezeh, 2017). Most rural economies in Kenya tend to be dominated by agriculture, which most people perceive as a less-lucrative job. They opt to move to towns anticipating better-paying jobs and upward social mobility, as suggested by Mberu et al. (2017).

Some of the notions discussed under the dual-sector theory correspond with neoclassical migration framework by Adam Smith and modernisation theory by Marx Weber. Neoclassical migration model holds that the critical trigger of migration is people's comparison of economic costs and benefits (psychological and financial) of moving to or out of an area (Mitze & Reinkowski, 2011). A free flow of production factors as the fundamental causes of migration as it generates wage differentials between industrialised and less industrialised areas. Likewise, modernisation theory maintains that migration is a social mobility process emanating from the progressive transition from traditional to modern society (Sunar, 2016). As such, areas that are quickly developing attract labour, thereby triggering migration waves and vice versa.

Lee's theory of migration holds that migration in any area results from the interplay of various factors, which are perceived differently (Reisi & Hashemianfar, 2012). Positive factors attract people from other areas and vice versa. Moreover, the theory states that long association with a particular area can result in the over-evaluation of that location's positive factors and the undervaluation of that area's negative attributes. Migrant choices and response to city challenges such as the high cost of living, overcrowding, joblessness, and health issues, which might be unbearable as suggested by Mudege & Zulu (2011), can depend on their evaluation of positive and negative factors in their previous and current residence. They consider returning home if they perceive being economically overburdened than their initial standard of living and vice versa. Nonetheless, the perceptions can be biased depending on the duration they resided in either area. By introducing the notion of over-valuation and undervaluation, the theory reveals why the rural people, especially youngsters, tend to be aware of the potential city challenges but persist with migration; they overvalue the city to rural life. Overvaluation and undervaluation of benefits and demerits explain why a substantial proportion of these migrants opt to prolong their stay in cities despite the challenges experienced. From lee's theory, people's tendency to balance the positives and negatives of the city relative to rural life shapes urban-rural migration.

Urban-rural migration can also be viewed from the perspective of Ravanstein laws of migration. Ravanstein postulates that distance and volume of migration have inverse relationships. The theorist asserts that every existing migration tendency tends to have a counter-current one. Therefore, as people flock in cities, some go back to the rural areas. The theory also holds that migration is economical, as people move from agricultural to industrial and commercial areas. This assertion is consistent with the dual-sector model, which characterises migration in emerging economies like Kenya (Oyefara, 2018). The theory also holds that local migration is dominated by females migrating while males tend to migrate internationally. Notably, the theory introduces a new variable in the concept of migration. In particular, it not only points out wages, but also gender in the concept of migration.

In an Africa, rural, land size ownership is culturally associated with level wealth (Akinola, 2018). People who own land in the urban areas lease or use it for commercial activities while in the rural areas, it is used for agriculture. If land is arable and there is sufficient market for agricultural goods, practicing agriculture can increase a person's income significantly. Thus, the size and quality of land a person has in rural area can influence return migration. Concerning gender, women tend to be susceptible to skewed labour policies, and occupation due to social-cultural limitations such as property ownership and inheritance (Akinola, 2018). With these restrictions, women hardly have a chance of engaging in agriculture and generating additional income from the sector when they migrate to the rural areas like their male counterparts. More educated and older people tend to be less vulnerable in terms of employment as they are associated with strong expertise and high productivity according to Hill & Barra (2014) and Kampelmann et al. (2018). Thus, less probable to change their occupation when they migrate. Besides, after retiring, people consider taking informal jobs for self-sustenance.

Methodology

Research Design and Data Collection Technique

A quantitative and descriptive research design were selected for this research. Primary numerical data were collected through survey for analysis. Data for this study were obtained in October 2019 by administering a survey and questionnaire. The recruited respondents were sent an electronic link via the Open-Data Kit (ODK). A section of respondents with information technology constraints

were interviewed via a phone-call conversation; all after securing an informed consent. An online survey and questionnaire captured respondent's socio-economic characteristics and demographic attributes such as age, income level estimates before and after migration, as well as occupation, education level, before and after they migrated, and land size owned in the rural area.

Sampling Method and Sample Characteristics

The sampling method was systematic and to ensure easy sample selection, sample frames were reduced from 44 to 6 rural counties using a purposive sampling procedure. The selected 6 counties recorded the uppermost intraregional migration flow, with an estimated 199547 returned migrants to these counties (GoK, 2019). Thereafter, a sample size of n=69 was determined using Fisher formula (Jung, 2014). Also, owing to the heterogeneity of the target population a design effect of 2.23 was used as illustrated below:

$n=Z^2pqD/d^2$

Where:

n= the desired sample size;

Z= the standard normal deviation, (1.95) which corresponds to the 95% confidence interval

P= the proportion of the target population estimated to have a particular characteristic (p=estimated, 0.12 was used);

Q=1-P =0.5; D=the design effect, usually 2.23

d=the degree of accuracy, which is 0.05;

The formula determined the sample of n=69, which was later stratified into six counties in Kenya namely; Kilifi, Murang'a, Nyamira, and Siaya counties each drawing 10 study participants. Conversely, Uasin Gishu County had 16 participants while 13 samples were recruited from Bungoma County. Thereafter, a snowball sampling technique was used to recruit the study participants, the returned migrants until the required threshold was achieved. Owing to the small sample size used as well as eliminating either type I error (alpha) of false positive or perhaps type II error (beta) of false negative, the research decided to use significance levels of 5% for P Values to prove in favour of the study hypothesis (Akobeng, 2016; Frane, 2015). According to Ross (2017), using a 5% significant level for P-values increases statistical power to obtain a more precise results, especially when the sample size is considered small.

Model and Variables

The study estimated the probability of income and occupational change when individuals return to rural areas of Kenya. Socioeconomic and demographic attributes of urban-migrants are used to establish which one of them are significant determinants of income and occupational change upon return. Owing to the dichotomous aspect of the migrants, a quantitative response economic model is appropriate. The model correlates the probability of the situation to several independent variables. Further, the model is essential to establish migrants' attributes that influence their decision to move from urban to rural areas. To obtain a comprehensive assessment for the decision to migrate to rural Kenya and its impact on income (yes or no) as well as change in occupation (yes or no), a probit model was applied. To establish associations between nominal explanatory variables, Chi-square measure of association was used.

Probit regression model was applied to estimate the probability of occupational change on the binary dependent variables. Much emphasis are placed on socioeconomic and demographic variables such as age, gender, relationship in the family, and land ownership in the rural areas. The model basically estimates the cumulative normal probability of the observations with the binary outcome variable (*Yi*) (Greene, 2012). The statistical significance of each socioeconomic and demographic independent variables estimates reveals the extent of influence the probability of income and occupational change.

The model assumed income change to be *1* and no change in income to be *0*. Conversely, change in occupation as *1* and no change in occupation as *0*. The probability P_i of change in occupation and income or not can be expressed as in the formula below, where Φ represents the cumulative distribution of a standard normal random variable (Greene, 2012; Uzunoz & Akcay, 2012).

$$P_i = prob\ [Y_i = 1 \mid X] = \int_{\infty}^{\dot{x}_i \beta} (2\pi)^{-1/2}\ exp\left(\frac{t^2}{2}\right) \mathrm{dt}$$

$$= \Phi\ (x_i\, \beta)$$

That said, Φ denotes a random residual with a normal distribution. Consequently, the real individual resolves to change occupation after moving to the rural area as well as having a change in income (Y_i) is such that the vector X_i comprises population attributes. Hence the marginal effect related to a continuous predictor variable such as age, gender, land size, education, as well as marital status on the probability $P(Y_i) = 1 \mid X)$, donating the outcome variable constant, can be achieved as follows [].

$$\frac{\partial P(y_i = 1|x_i)}{\partial x_i} = \frac{\partial E(y_i|x_i)}{\partial x_i} = \varphi(x_i\beta)\beta$$

Where Φ donates the probability density function of a standard normal variable. Notably, the marginal effect on dummy variables was estimated exceptionally from continuous ones. The discrete change in the predicted probabilities encompasses a substitute to the marginal effect when examining the impact of a dummy variable (Greene, 2012; Uzunoz & Akcay, 2012), as expressed below:

$$\Delta = \Phi\left(\underline{x}\beta, d = 1\right) - \Phi\ (\underline{x}, \beta\ d = 0)$$

The estimated coefficients and marginal effects show the way the outcome variables such as family size, family income, and land size owned in rural areas, marital status, age, gender, and education influence the probability of magnitude of change in occupation and income. For instance, if employment status (dummy variable) changes from zero to one when returning to the rural area, the probability of change in income increases. STATA13 was used to calculate the marginal effects for each explanatory variable for the observation before and after migration while keeping the dependent variable constant at their average values. Excel 2013 and SPSS20 were helpful for descriptive statistics.

Studies such as Uzunoz & Akcay (2012) reveal statistically significant results for gender, age, marital status, education level, family size, and the relationship to household head as well as employment status as explanatory variables to estimate their marginal effect on outcome variables using probit model. Further, using the Binomial probit model, the study assumes that these migrant's socioeconomic and demographic attributes could trigger a statistically significant result. Table 3-1 presents descriptive for the variables.

Results and Discussion

Descriptive Results

Summary statistics, measure of central tendency, standard deviation, for the sample socio-economic attributes and demographic status are presented in Table 3.1.

Table 3.1: *Descriptive Statistics for Socio-economic and Demographic attributes*

	%/Average		*SD*
	Male	*Female*	
Individual Attribute			
Gender	52%	36.4%	NS
Married	58%	48%	NS
Education level		59%	
Primary	93%	90%	***
Secondary	69%	65%	NS
College	51%	43%	***
University	44%	36%	NS
Household Relationship			
Household head	60%	43%	NS
Spouse	11%	69%	NS
Child	70%	76%	NS
Job Status (Before Migration)			
Employed	71%	59%	NS
Unemployed	20%	29%	NS
Occupational Choices			
Self-employment	38%	67%	***
Farmstead labour	13%	51%	***
Education/research	71%	49%	NS
Manufacturing	67%	43%	NS
Civil Service	54%	36%	NS
Informal sector	47%	33%	NS
Sample size (n=69)	*25*	*24*	

On average, male 71% and female 59% confirmed that they had jobs before urban-rural migration. Unemployment rate for male was at 20% while females were at 29%. More females than males were working in the cottage industry, personal businesses (entrepreneurship) and farms after migration. By contrast, the males surpassed the females in industries such as civil service, education and research as well as manufacturing as presented in Table 3-1. Respondent's household size is 3 with 5 maximum members. 59% of families had between one and two elderly people aged 70 years and above. The average size of land owned was 0.99acres. Before migration, the average family income is 374 USD, while average monthly income after migrating is 397 UDS, as presented in Table 3-2.

Table 3-2: *Descriptive Statistics for Respondents Household and Income*

Household attributes	*Mean value*	*Min*	*Max*	*SD*
Age	42.2	25	*86*	15.95
Family size	*3.00*	*1.00*	*5.00*	*2.051*
male dependants	3.00	1.00	5.00	1.269
female dependants	2.00	1.00	4.00	0.991
the aged members (70+ years)	1.00	1.00	2.00	0.471
Land per individual in rural area (Acre)	0.99	0.25	5.00	***
Family income				
Monthly Income before migration	374	155	506	53.1
Monthly income after Migration	397	171	1197	213.51
Sample Size	49			

The average incomes for those working in the agricultural sector rose from 390 USD to 490 USD. Contrariwise, employees working in the educational sector experienced a growth of income from 390 USD to 400 USD. Workers in the manufacturing sector experienced an average growth in incomes from USD 400 to 500 USD. The 100 USD increment is significant and conceivably attributed to manufacturing acumen that the return migrants could have obtained while in their city stay, hence bolstering their wage. A line chart was generated to establish income change trends among respondents; before and after migration as shown in Fig 3.1.

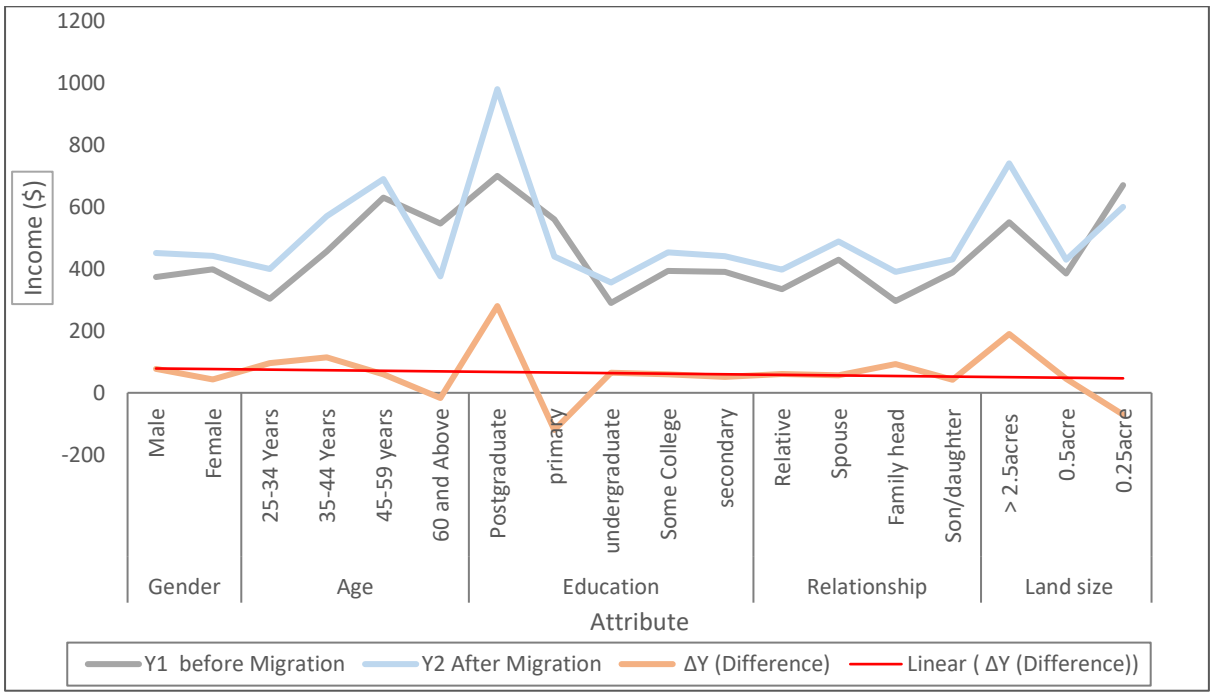

Figure 3.1 Income (Y) Change (Before and After Migration)

Return migrants with postgraduate degree as well those participants with rural land more than 2.5 acres have significant income increment as compared to those primary leavers, respondents aged

more than 60 years as well as rural land less than 0.25acres, whose income decreases upon return. Table 3-3 presents cross-tabulation analysis to examine association within respondents socio-economic attributes/variables observed from occupational change.

Table 3-3: Cross-tabulation change in occupation and respondent demographic characteristics

Variables Description	*Group*	*Change in career (%)*		*Phi*	*Cramer's V*
		No	Yes		
Gender	female	29	71**	1.016	.718
	male	67	33		
Age					
	25-34 Years	71	50.	1.324	.765
	35-44 Years	0.0	14		
	45-59 years	14	17		
	60 and Above	17	83**		
Education					
	postgraduate	0.0	4	1.149	.663
	primary	14	0.0		
	secondary	0.0	21		
	vocational	28	32		
	undergraduate	57	28		

Note: The asterisk indicates a statistically significant difference at the p<.01 level

From table 3.3, it's observed that females in contrast with males were more exposed to career change (71% and 33% respectively, *phi*=1.016, Cramer's V= .718). However, the results indicated that the returnee's education was not a significant determiner of career change. Males and people aged between 25-34 years were the least likely to change careers based on our results. The proportion of those involved in the agricultural sector increased from 5% to 19%.In education and research, the percentage dropped from 20% to 15%. The number of those in the civil service rose from 19% to 36% and represents the highest change. The proportion of people working in the informal sectorreduced from 20% to about 6%. The largest decline was experienced in the manufacturing sector. Those in the sector fell from 30% to about 3%. That said, the number of those working as small business owner rise from 15% to 30%.

Empirical Results

To estimate the probability and significance of income change upon migration to the rural area, a probit regression model was performed on different socio-economic attributes and demographic status. Parameter estimates and maximum likelihood estimates across the measured independent variables. The computed marginal effect and coefficients results are disintegrated based on sample's socio-economic and demographic status, given in Table 3-4.

Table 3-4: Probit Model Bivariate estimates for income change on returned migrants

Variable Description	Coefficients	Marginal effect	*Std Error*
-individual attributes			
Female	0.087	-0.123	*0.057*
Male	0.096	0.093	*0.089*
25-34years	0.178	0.041	0.097
35-59years	0.399**	0. 421	0.213
60 and Above	-0.369**	-0.312	0.224
-Education			
primary	-0.459**	-0.226	0.327
secondary	0.197	0.083	0.019
college	0.241	0.135	0.184
Undergraduate degree	0.232	0.234	0.195
postgraduate degree	0.513**	0.591	0.333
-Employment			
self-employed/business	0.068	0.102	0.034
employed in government	0.372**	0.220	0.138
part time Job (Yes=1)	0.083	o.105	0.069
experience more than 7 years	0.161	0.161	0.031
experience less than 2years	0.097	0.217	0.044
self-employed/business	0.068	0.102	0.034
employed in government	0.372**	0.220	0.138
-Land Size in the Rural Area			
Less than 2 acres	0.274	0.170	0.191
Above 2.5 acres	0.507**	0.473	0.474
Sample size	49		
Wald Chi-square	3.891		
Wald test of ρ=0.00	0.014		
Log pseudolikelihood	9.701		

Note: The double asterisks indicate a statistically significant results at the p<.05 level

Table 3.4 reveals the coefficients of the income change and their statistical significance, as well as marginal effect (probability). The results find that statistically significant change in income for returning migrants varies across different socio-economic and demographic characteristics. As such, reject the first study null hypothesis at significance level of 5% (P<0.05). The results imply that significant probability for income change varies across different socio-economic attributes and demographic status. Ideally, while some population characteristic have significant income increment, other have significance income reduction while other characteristics are neutral. For significant and positive income increment were: age 35-59years (R^2 = 0.399, p<0.05), postgraduate degree (R^2 = 0.513, p<0.05), rural land size above 2.5acres (R^2 = 0.507, p<0.05), and returnees employed in government (R^2 = 0.372, p<0.05). By contrast, returnees above 60 years of age (R^2 = -0.369, p<0.05), primary school leavers (R^2 = -0.459, p<0.05) significantly predicted a negative monthly income reduction.

The Wald chi-square value 3.891 and test of p-value 0.014 for the entire model implies that the entire data used were statistically significant. For marginal effect, when all the other socio-economic predictor variables are held constant varies; those who had more than 2.5acres of land obtained a marginal income rise of 47.3%, part-time jobs, and the self-employed, the marginal income rise was 10.5% and 10.2% respectively. Among returnees with more than 7 years of experience, the marginal probability of income rise was 16.1%. Besides, returnees that left the city to assume government-related jobs in the rural areas were at 22% likelihood of income increment. Individuals aged 35-59years experienced a 42.1% marginal increase in income after migration. Females are susceptible to marginal decline of 12.3%. Studies such as Kabir et al (2019); Sarah (2012); Stokes et al (2015), list agribusiness and rural small-scale entrepreneurship (produce and cereal selling), and farm labour, among some of the rural income generating activities that migrants who experienced income boost might have explored upon return.

To assess the probability of occupational change upon migration to the rural area, a maximum likelihood test using probit regression model was calculated on each predictor variable to obtain marginal effect and coefficient values. The estimated values are broken down based on sample's socio-economic and demographic status, given in Table 3-5.

Table 3-5: Probit Model Bivariate estimates of migrant and occupational change

Variables (Determinants)	Coefficients	Marginal effect	Std Error
-individual attributes			
Female	0.326**	0.310	0.241
Male	0.219	0.119	0.107
25-34years	0.113	0.108	o.068
35-59years	0.256	0.193	0.143
60 and Above	0.797**	0.651	0.688
- Education			
education (primary)	0.348**	0.312	o.068
secondary	0.268	0.168	0.019
college	0.207	0.151	0.184
Undergraduate degree	0.113	0.130	0.195
postgraduate degree	0.092	0.294	0.333
- Marital status			
separated/divorced=3	0.129	0.137	0.067
married = 2	0.288	0.069	0.187
Employment			
Self-employed/business	0. 269	o. 096	0.934
employed in government	0.196	0. 125	0.125
experience more than 7years	0.082	0.167	0.023
experience less than 2 years	0. 416**	o. 520	0.391
-Land size in rural area			
Less than 2acres	0.203	0.216	0.183
Above 2.5 acres	0.517**	0.527	0.479
Sample size	49		
Wald Chi-square	3.891		
Wald test of ρ=0.00	0.0314		
Log pseudolikelihood	7.362		

Note: The asterisk indicates a statistically significant difference at the p<.05 level

Based on these results, female gender (R^2 = 0.326), primary level of education (R^2 = 0.348), land size above 2.5acres in the rural areas (R^2 = 0.517) and working experience less than 2 years (R^2 = 0.416). Also migrants aged 60 years and above (R^2 = 0.797) were significant predictors of occupational change. Conversely, marital status (R^2 = 0.129 divorced, R^2 = -0.288 married), degree holders (R^2 = 0.113 and 0.092 respectively), experience more than 7years (R^2 = 0.082) have weak probabilities towards occupational change. It is essential to note that having returnees that were either employed in government or those with more than 7years of experience were reluctant to occupational change (R^2 = 0.196, R^2 = 0.082) respectively. Given the result, there is a significant empirical evidence to reject the second null hypothesis at significant level of 5%, ($p<0.05$). The study surmises that significant probability for occupational change among returned migrants are determined by low education level, female gender, the old age, huge rural land size, and low migrant's job-related expertise level.

As postulated earlier, the elderly migrants could have reached the decision to return back home for retirement. Those with low educational attainment, might have been susceptible to unforeseeable layoff, hence decided to return to their rural homes. The marginal effect of migration reveals that returnees of above 60+years had 65.1%. Also, the size of land owned by the migrants above 2.5 acres in the rural area predicted a chance of 52.7% occupational change after migration. Rural land and

perhaps its size is noteworthy asset that puts return migrants on the proxies of increase livelihood and economic opportunities, which not only trigger income generation, but also career change in case the returnee decide to undertake agribusiness. Dobryagina (2019), claims that modern multi-agency system policies such as that of European Union are devoted to rural entrepreneurship in agriculture motivation. Borrowing from her argument, it can be perceived that rural agencies and devolved governments in Kenya are also undertaking wide spectrum of agribusiness policies, which tend to motivate the return migrants to venture in agribusiness to boost their income. Per se, rural land size could be a significant determinant to return migrant income change as well as an incentive for the migrant to change their occupation and venture in farming upon returning to their rural area.

Migrants with less than 2year of working experience and returnees of female gender (52.0% and 34.8% respectively). The results imply that female gender could be susceptible to skewed labour and a male-dominated rural occupational structure and cultural limitations such as unequitable land rights (Akinola, 2018; Cortes & Pan, 2018), which make them easily shift their occupation and decide to venture in less lucrative rural opportunities. These limitations among others, perhaps could place women to high probability of income reduction and occupational change as compared to males upon rerun to rural areas. It's apparent that the less educated (primary leavers) returnees are more probable to change their occupation given their weak job expertise (Hill & Ybarra, 2014). This group is also significantly exposed to income reduction as empirical evidence shows in Table 3-4 and Table 3-5. Contrariwise, high education level and age is usually correlated with strong expertise and high productivity (Kampelmann et al, 2018). Land size in rural areas was a prime factor associated with both income and occupational change since the likelihood of joining agriculture after assigning dummy variables, and setting the baseline at two years, especially for returnees with more than 2.5acres of land size was noteworthy to change occupation at 52.5% and 47.3% for income increment. The land size variable interchangeably determines low or high likelihood for income and occupational change depending on the size of the rural land.

Discussion

The descriptive and probit model generated to establish income and occupational change among migrants reveals that personal attributes predict the outcome variables. The results on income change indicate that employed people have a lower likelihood of being return migration candidates. The research also found that males are likely to migrate home than their female counterparts, which contradicts Ravanstein's migration model argument that more women than men migrate locally. The research establishes a higher average income before migration than after the migration. The average earnings might not be the critical motivation to move away from cities. This is inconsistent with the dual-sector theory, which holds that wage differentials between the rural and urban areas inspire movement from the former to the latter. However, the research is partially consistent with the neoclassical and Lee's theory of migration, which suggests that migration is inspired by a comparison between costs and benefits, and Lee's theory that various factors whose perception is unique influence migration (Reisi & Hashemianfar, 2012).

The research established determinants to income changes after return migration. As postulated, the older adults and those with the lowest education are the most probable urban-rural migration candidates. Older people could prefer a less busy life in the city after retirement, while those with low education are susceptible to unforeseeable layoffs. Rural land ownership and its size are remarkable predictors of urban-rural migration as improvement of economic conditions in the rural areas through devolution make agricultural investments profitable for this category. The participants working in the civil service, manufacturing, small business owners and aged between 35-50 years experienced a significant increase in income after the migration. This can be attributed to segments' likelihood to land on better-paying jobs, and engaging in profitable economic opportunities. However, since it involves going back to the rural areas, only Lee's migration model can explain it. People balance the costs and benefits of a particular decision on their economic outcomes (Reisi & Hashemianfar, 2012). Civil servants would relocate to their rural areas to assume new roles after job promotions. However, there is a decline in some of the respondents' average income in this research, which indicates the presence of

other incentives for return migration other than the collectively accepted economic opportunities. Ideally, the migrants consider the possibilities of saving more, despite a lower earnings in the rural areas and opt to migrate. This is consistent with the neoclassical migration model which suggests that people consider the costs and opportunities of migrating before making a decision (Mitze & Reinkowski, 2011).

About the probability of income increase after urban-rural migration, being 40 years and above, having a postgraduate degree, and owning more than 2 acres of land had the highest income increase. Being self-employed and working in the civil service exhibit moderate-income increase while being female negatively correlated with the possibility of experiencing an increase in income after this migration. Such probability of low likelihood of improving income is associated with the gender inequalities generated by customs. Since women tend to be excluded from land inheritance, as argued by Akinola (2018) their likelihood of benefitting from agriculture is low. The Wald chi-square value and maximum likelihood estimates across the measured independent variables in table 3.4 indicate that the probabilities of income changes are statistically significant at $\alpha=0.01$ and $\alpha=0.05$, which implies a rejection of the null hypothesis (the changes in income after return migration is significant, $P<0.05$).

The second objective was to determine occupational change and its associated probabilities across various socioeconomic and demographic profiles after return from cities. As indicated in table 3.5 results, the proportion of respondents involved in agriculture, civil service, and small scale businesses rose significantly while those in education and research, cottage industry, manufacturing declined significantly. Table 3-5 suggests that married spouses' probability of changing their occupations after the migration about half of that of separated and divorced migrants. People above 60 years had the highest probability of changing their occupation after migration, and this is attributed to the tendency of them to retire from one sector and shift to other economic activities such as rural farming. Primary school dropouts were more than 2.5 times more likely to change careers as university graduates. The distinct favourableness of cities to people with varying levels of education can explain this. More educated people have a higher likelihood of landing on better jobs in the city and opt to stay there compared to their less educated counterparts. They only choose to migrate to the rural areas, when they are guaranteed of lucrative opportunities like civil service jobs and businesses. Also, their migration to the rural areas is significantly inspired by income. Conversely, the less educated people are less job-selective than their skilled counterparts. Hence, they can take lowly-paying jobs after going home, which explains their high likelihood of experiencing a significant income increase. Married people are highly rigid in changing their careers.

The enactment of devolved governance can explain the sectorial gains in terms of labour to some extent. Ideally, the policy could have increased the payoffs in small scale commercial activities and agriculture, thereby triggering migration as suggested by the Modernisation model (Sunar, 2016). Devolution triggers transition of the rural economies to trigger waves of migration into them. In the Kenyan set up, the improvement of the economies through resource distribution made the existing sectors such as agriculture lucrative, and consequently, attraction of retirees, small scale business people, and those with meagre incomes from the city. A significant increase in the proportion of civil service employees can be linked to the increase in the civil service jobs, which drew people from other sectors. The education and research career decline can be attributed to employees switching to county government. By contrast, the informal sectordecline can be linked to the negative attitude about its lucrativeness among the participants. The largest decline was experienced in the manufacturing sector. The proportion of the sector respondents fell from 30% to about 3%. Ideally, this can be associated with the differences in the sectorial composition between the city and the rural area. More manufacturing industries are concentrated in the city. The motivation for migration was to take on alternative jobs and other economic opportunities.

Conclusion

This study sought to investigate income and occupational change implication upon urban-rural migration under the devolved system of governance in Kenya. By applying the first probit regression model, the study finds that the probability for significant income change varies across different socio-economic attributes and demographic status. As such, the first null hypothesis is rejected and the study

supports that claim that some people's incomes significantly increase while others significantly decline based on their socio-economic characteristics and demographic profiles. This implies that income is not the necessary motivation to return to the rural areas. The second probit model finds that significant probability for occupational change among returned migrants are determined by low education level, female gender, the old age, huge rural land size, and low migrant's job-related expertise level. Thus, the study reject the second null hypothesis. Generally, picking from the study findings, return migrants that are less educated, having more land at home, and married are more likely to migrate to the rural homes than their single/divorced, highly educated and having smaller size of land. The probability of less educated youths returning home from the city was higher than their educated counterparts, but the probability of experiencing income growth is lower. The few migrants with postgraduate degrees had a significant income surge. Though, the results found that, this group returned to their rural areas to assume better paying formal jobs. Using the results, we are at ease to summarise the following;

i. Occupational dynamics reflect on the preferences of people; those in the informal sectoras well as college educational level and below, exhibited a significant probability of career change as compared to highly skilled university degree holders.

ii. Migrants that are more than 35 years, having university education and large pieces of land have a higher chance of experiencing income growth. A significant proportion of respondents ventured in private enterprises and agriculture upon return, which was attributed to the socio experience gained while in the city, which possibly encouraged attitude change towards self-employment and economic changes that have made the agricultural sector an increasingly lucrative business.

Limitation to the Study

Limitation to our study is the small sample size of 69 respondents. Though, given that our study accepted a margin error of 8% and confidence level of 95% for a return migrant's population of around 199,547, for the six counties (GoK, 2018) and 35% response distribution for each question, our sample is a representative of would be 51% of the total population. To increase statistical power and obtain credible results, the study used a significance level of 5% Using Weisburd paradox theory, the ability to influence statistical power through increasing sample size is not as strong as statistical theory would suggest. Studies with larger sample sizes usually generates smaller effects. Further, the associations are unobservable between sample size and statistical power since the sensitivity obtained from increasing sample size is offset by effect size concurrently decreasing (Nelson et al., 2015).

Declarations

Availability of data and material

Dataset and any relevant material is available upon request.

Conflict of Interest

The authors declares no conflict of interest

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Authors' contributions

The two authors equally contributed towards this research in regard to sample recruitment, data collection, analysis, and report writing.

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References

Ajaero, C. K., & Onokala, P. C. (2013). The effects of rural-urban migration on rural communities of southeastern Nigeria. *International Journal of Population Research, 2013*.

Akinola, A. O. (2018). Women, culture and Africa's land reform Agenda. *Frontiers in psychology*, *9*, 2234.

Akobeng, A. K. (2016). Understanding type I and type II errors, statistical power and sample size. Acta Paediatrica, 105(6), 605-609.

Cali, M., & Menon, C. (2013). Does urbanization affect rural poverty? Evidence from Indian districts. *The World Bank Economic Review*, *27*(2), 171-201.

Cortes, P., & Pan, J. (2018). Occupation and gender. *The Oxford handbook of women and the economy*, 425-452.

Dobryagina, N. (2019). Agricultural Entrepreneurship Motivation Policies: European Union Experience and Decision Theory Application. *International Journal of Rural Management*, *15*(1), 97-115.

Ernst, K. C., Phillips, B. S., & Duncan, B. D. (2013). Slums are not places for children to live: vulnerabilities, health outcomes, and possible interventions. *Advances in pediatrics*, *60*(1), 53–87. https://doi.org/10.1016/j.yapd.2013.04.005

Eshetu, F., & Beshir, M. (2017). Dynamics and determinants of rural-urban migration in Southern Ethiopia. *Journal of Development and Agricultural Economics*, *9*(12), 328-340.

Frane, A. V. (2015). Are per-family type I error rates relevant in social and behavioral science?. Journal of Modern Applied Statistical Methods, 14(1), 5.

Garip, F. (2012). An integrated analysis of migration and remittances: Modeling migration as a mechanism for selection. *Population Research and Policy Review*, *31*(5), 637-663.

Government of Kenya (GoK). (2019). *Kenya Population and Housing Census Results*. Nairobi: KNBS.

Government of Kenya, (GoK). (2016). Policy on the Devolved System of Government. Nairobi: Government Printers.

Greene, W. H. (2012). Application: Binomial Probit Model. In *Econometric Analysis 7th Edition* (pp. 711-714). London: Prentice Hall, Pearson Education.

Greene, W. H. (2012). Endogeneity and Instrumental Variable Estimation. In *Econometric Analysis 7th Edition* (pp. 259-270). London: Prentice Hall, Pearson Education.

Hernández-Murillo, R., & Marifian, E. A. (2013). District Overview: Urban Areas Host the Largest Manufacturing and Service Employers. *Regional Economist. Missouri.*

Hill, H. D., & Ybarra, M. A. (2014). Less-Educated Workers' Unstable Employment: Can the Safety Net Help? Fast Focus. No. 19-2014. *Institute for Research on Poverty*.

Jung, Sin-Ho. (2014). Stratified Fisher's Exact Test and its Sample Size Calculation. *Biometrical journal*. 56(10), 129-40.

Kabir, M., Radović Marković, M., & Radulović, D. (2019). The determinants of income of rural women in Bangladesh. Sustainability, 11(20), 5842.

Kampelmann, S., Rycx, F., Saks, Y., & Tojerow, I. (2018). Does education raise productivity and wages equally? The moderating role of age and gender. *IZA Journal of Labor Economics, 7*(1), 1-37.

Kenya National Bureau of Statistics, Ministry of State for Planning, National Development and Vision 3030. (2012 b). *Analytical Report on Migration*. Nairobi: Government Printer.

Leigh, N. G. (2013). Strengthening urban industry: The importance of infrastructure and location. *Infrastructure and Land Policies*, 318-340.

Mahabir, R., Crooks, A., Croitoru, A., & Agouris, P. (2016). The study of slums as social and physical constructs: Challenges and emerging research opportunities. *Regional Studies, Regional Science*, *3*(1), 399-419.

Mallach, A. (2018). *The divided city: Poverty and prosperity in urban America*.

Marra, G., Papageorgiou, G., & Radice, R. (2013). Estimation of a semiparametric recursive bivariate probit model with nonparametric mixing. *Australian & New Zealand Journal of Statistics*, *55*(3), 321-342.

Mberu, B., Béguy, D., & Ezeh, A. C. (2017). Internal migration, urbanization and slums in sub-Saharan Africa. In *Africa's population: In search of a demographic dividend* (pp. 315-332). Springer, Cham.

Moloi, T., & Marwala, T. (2020). The Dual-Sector Model. In *Artificial Intelligence in Economics and Finance Theories* (pp. 33-41). Springer, Cham.

Mudege, N. N., & Zulu, E. M. (2011). In their own words: assessment of satisfaction with residential location among migrants in Nairobi slums. *Journal of Urban Health*, *88*(2), 219-234.

Mueller, V., & Thurlow, J. (2019). *Youth and jobs in rural Africa: Beyond stylized facts* (p. 336). Oxford University Press

Nelson, M. S., Wooditch, A., & Dario, L. M. (2015). Sample size, effect size, and statistical power: A replication study of Weisburd's paradox. *Journal of Experimental Criminology*, *11*(1), 141-163.

Oyefara J.L. (2018) Migration and Urbanization in Africa. In: Oloruntoba S., Falola T. (eds) The Palgrave Handbook of African Politics, Governance and Development. Palgrave Macmillan, New York. https://doi.org/10.1057/978-1-349-95232-8_27

Papaelias, T. (2013). A theory on the urban rural migration. *International Journal of Economics & Business Administration*. 1(4), 17-30.

Pieterse, D. E. (2013). *City futures: Confronting the crisis of urban development*. Zed Books Ltd.

Ross, SM. (2017). Testing Statistical Hypotheses. In S. M.Ross, *Introductory statistics* (pp. 381-432). London: Academic Press.

Sarah, A. (2012). Determinants of rural household income diversification in Senegal and Kenya. 6èmes Journées de recherches en sciences sociales SFER-INRA-CIRAD. SFER, INRA, CIRAD, Toulouse School of Economics. Paris: SFER, 18.

Stokes, E., Lauff, C., Eldridge, E., Ortbal, K., Nassar, A., & Mehta, K. (2015). Income generating activities of rural Kenyan women. Journal of Sustainable Development, 8(8), 42.

Tacoli, C., McGranahan, G., & Satterthwaite, D. (2015). *Urbanisation, rural-urban migration and urban poverty*. Human Settlements Group, International Institute for Environment and Development.

Uzunoz, M., & Akcay, Y. (2012). A case study of probit model analysis of factors affecting consumption of packed and unpacked milk in Turkey. *Economics Research International*, *2012*. https://doi.org/10.1155/2012/732583

Verma, J. P., & Verma, P. (2020). Introduction to Sample Size Determination. In J. P. Verma, Determining Sample Size and Power in Research Studies: A manual for Researchers (pp. 1-7). Singapore: Springer.

Zulu, E. M., Beguy, D., Ezeh, A. C., Bocquier, P., Madise, N. J., Cleland, J., & Falkingham, J. (2011). Overview of migration, poverty and health dynamics in Nairobi City's slum settlements. *Journal of Urban Health*, *88*(2), 185-199.