

**Rural-Urban Migration, Urbanisation and Unemployment: The Case of Tanzania
Mainland**

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Abstract

This paper looks into rural-urban migration, urbanisation and unemployment in Tanzania Mainland based mainly on census surveys of 1988, 2002 and 2012, which are augmented by the other data source. Three stage least squares technique is employed to run pooled cross section data regression to examine factors associated with rapid urbanisation and unemployment, including urban in-migration from the rural areas. Results show that urbanisation and urban traditional sector unemployment are the migration phenomena, and they are both significantly driven by rural-urban per capita income differential and high propensity of in-migration. The results indicate need for accelerated rural development to raise rural incomes and to provide adequate services as a way to reduce urban in-migration.

Key words: Urbanisation; unemployment; rural; urban; Tanzania

JEL Classification: J6, O15, P25, R23

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1. Introduction

Growth of urban workforce in less developed countries (LDCs) has usually exceeded absorptive capacity in relation to available decent jobs for the new entrants in the labour market. In some instances, expansion of urban population owing to rural-urban migration has exacerbated unemployment (Barnum and Sabot, 1977). The movement of rural people out of agriculture in order to find alternative jobs in urban centres is one of the major challenges surrounding development process especially in developing economies. This does not necessarily mean that migration should always involve adverse effects but if it does not happen concurrently with an increase in urban absorptive capacity, it becomes an economic challenge. The aggregate effect of migration has important implications to the institutional and social conditions in both rural and urban areas. High migration rate may lead to excessive urbanisation amid unemployment and/or underemployment problems. In the literature, poverty and lack of opportunities in the rural areas are identified as push factors, while urban job opportunities constitute pull factors (Barnum and Sabot, 1977). Although urbanisation can lead to economies of scale and growth, excessive urbanisation may cause inefficiency if there are limited job opportunities in urban sector.

The history of ‘rural to rural’ and ‘rural to urban’ migration is episodic and dates back to colonial setting, and later the country’s socialist ideology, decentralization and finally the influence of contemporary economic reforms. Rural migration sprouted from the demand for labour force in plantations during colonial rule; and after independence in 1961, the socialist community-level farming policies intensified rural migration in pursuit of the centralized villages programme. Rural urban migration in Tanzania gained momentum during decentralisation and creation of new regional capitals in the 1970s as well as economic liberation of the 1980s with migrants investing savings in their own ventures in towns instead of sending remittances to the rural areas (Msigwa and Mbongo, 2013). In the 1970s and 1980s, internal labour migration occurred between the labour reserve areas and plantations within the country; and emigration trend of Tanzania has been changing with repatriation and naturalisation of refugees (Kweka, 2014).

Urbanisation in the country increased from about 6% in 1967 to nearly 30% in 2012 (Wenban-Smith, 2014). Regional capitals of Dar es Salaam, Arusha, Mbeya and Mwanza have grown substantially as compared to their many smaller settlements. Basic demographic and socio-economic profile report of Tanzania (URT, 2014), which was drawn from population and housing census indicates that urban households were on increase, partly and largely, due to rural-urban migration. Therefore, urban population in Tanzania has been expanding due to natural growth of population, rural to urban migration, expansion of the recognised boundaries of urban areas, and reclassification of rural areas as urban in the course of time (Wenban-Smith, 2014). According to the New Economics of Labour Migration, rural-urban migration is caused and perpetuated by income and poverty differences between rural and urban areas (URT, 2013). Basic needs poverty by head count in 2011/2012 Household Budget Survey was 4.2 percent in Dar es Salaam and 21.7 percent in other urban centres while in rural areas it was much higher, 33.3 percent. During the same time, extreme poverty (food) was 1 percent in Dar es Salaam and 8.7 percent in other urban areas whereas in the rural was 11.3 percent. Table 1 shows urban population growth in Mainland Tanzania.

Table 1: Urban Population growth in Tanzania Mainland, 1967-2012

	1968	1978	1988	2002	2012
Dar es Salaam (Growth % p.a)	272,821 (7.8)	769,445 (9.9)	1,205,443 (4.6)	2,336,055 (4.8)	4,364,541 (6.5)
Regional Capitals (RCs) (Growth % p.a)	363,135 (5.7)	919,949 (8.8)	1,484,512 (4.9)	2,593,163 (4.1)	3,989,447 (4.4)
Other Urban (Growth % p.a)	49,136 (7.1)	568,527 (24.9)	1,309,927 (8.7)	2,625,620 (5.1)	4,341,764 (5.2)
Total urban (Growth % p.a)	685,092 (6.5)	2,257,921 (11.5)	3,999,882 (5.9)	7,554,838 (4.7)	12,701,238 (5.3)
Rural Population (Growth % p.a)	11,290,665 (3.0)	14,778,578 (2.5)	18,507,165 (2.3)	25,907,011 (2.4)	30,924,116 (1.8)
Total Population (Growth % p.a)	11,975,757 (3.1)	17,036,499 (3.3)	22,507,047 (2.8)	33,461,849 (2.9)	43,625,354 (2.7)
Dar/Total Urban (%)	39.8	34.1	30.1	30.9	34.4
RCs/TotUrb (%)	53.0	40.7	37.1	34.3	31.4

Source: Wenban-Smith, 2014 and Migration and Urbanisation URT (2015)

Migration and urbanisation report of 2015 shows patterns of migration, indicating regions with positive net-immigration in both 2002 and 2012 censuses (URT, 2015). For example, the 2012 census results show that Dar es Salaam had more than 2 million immigrants, representing about 31 percent of total migrants because of its relatively strong industrial and commercial base. The report shows further that the regions with persistent negative net-migration in both censuses are the ones with inadequate employment opportunities, limited land for settlement, or those with overwhelming population pressure. These include the south corridor regions of Lindi, Mtwara and Ruvuma, *inter alia*. It is notable that the rapidly urbanizing regions in Tanzania have had positive net migration. This can be due to economic pull factors and agglomeration economies. Nevertheless, there is unemployment pressure exerted by rural-urban migration, and over 70 percent of urban dwellers live in unplanned settlements with inadequate roads, transport, housing, water, sewerage and sanitation, electricity and other services. This indicates inability of the urban sector to unleash migrants' anticipated opportunities. Migrants do not move only due to expected income gains in urban areas but also owing to other factors both push and pull. Our interest in this paper is to unearth the extent to which the major economic factor (i.e. income) has pulled migrants; and whether unemployment pressure in traditional urban sector can be attributed to migration, among other.

Tanzania prioritised agriculture as the backbone of the economy after independence, and at present the country is striving toward a semi-industrialised middle income economy by 2025 as stated in the Development Vision, 2025 (URT¹, 1999). In view of this, there is a dual need for labour force in the country: first, in the rural areas where labour intensive farming is practiced; and second, skilled labour in the urban areas where industries are established. A concern is whether migration from rural to urban areas can suitably provide the quality of labour needed in urban sector. Migration without requisite skills adds labour in the urban traditional sector², which increases urban unemployment pressure. Further, rural migration in a labour intensive agricultural economy raises another concern about inefficiency in labour resource allocation since people move from where they can be employed to where they might be almost totally unemployed.

This paper addresses challenges associated with rural-urban migration, which enhance urbanisation and so increasing pressure on urban unemployment in Tanzania. The debate today on migration and urbanisation in Africa is whether migration can generate rapid urban economic growth instead of the 1990s debate as to whether the poor state of urban economies could deter rural-urban migration (Potts, 2016). Our paper provides analytical backing to the challenges of migration and its implication on jobs situation, particularly in the urban traditional sector based on accessible census data. Important research questions revolve around migration cause factors and employment challenge. Specifically, the paper intends to meet two main objectives regarding rural-urban migration in Mainland Tanzania: (i) to ascertain significance of income differential in relation to rural-urban migration as the hypothesised driving force; and (ii) to establish magnitude of urban traditional sector unemployment pressure that is exerted by the rural-urban migration.

¹ URT is an abbreviation of United Republic of Tanzania.

² Rural-urban migration in less developed countries can be viewed as a two-stage phenomenon according to Todaro (1969). First is addition of labour to urban traditional sector, which is a pool to which in-migrants in the urban areas are situated while waiting to be employed in some jobs in the modern urban sector. They are not regularly employed at this stage, or are underemployed, and some are engaged in sporadic employment, while a good number of them grind out meagre existence in petty itinerant trading. Second, is a stage of relatively more permanent employment when one secures a job in the modern urban sector.

The main sources of data are the Population and Housing Census (1988, 2002 and 2012); Employment and Earnings Surveys, and the Tanzania National Accounts.

The remainder of this paper is organized as follows. Section 2 reviews theoretical and empirical perspective of rural urban migration. While Section 3 shows the Methodology, section 4 presents descriptive statistics and variables diagnostics. Section 5 reports and discusses regression results. And finally, Section 6 concludes

2. Theoretical and Empirical Perspectives of Rural-urban Migration

Migration theories hover around three perspective; first, micro-level theories which focus on individual decisions. They argue that migration is caused by individual values or desires, and anticipations such as improved survival, wealth, etc. Second, macro-level theories which look at aggregate migration trends and relate these trends with macro-level outcomes of the economic structure (income and employment opportunities differentials). Third, meso-level theories which are between the micro and macro levels. For example, there is argument for migration causes associated with the household or community level factors (Hagen-Zanker, 2008). The early studies looked at aggregate data and often saw migration as employment equilibrating mechanism. From the 1980s more elaborate microeconomic models emerged, and these models examine individual motivations to migrate, including structural community level factors such as persistent poverty.

Macro-level theories of migration: the standard point of view of these theories is that migration occurs due to the state economic development. According to early models of Lewis (1954), and Ranis and Fei (1961), internal migration occurs as a result of geographical differences in the supply and demand of labour, mostly between the rural traditional agricultural sector and the urban modern industrial sector. Rural workers are attracted by the positive wage gains as they move to urban sector, i.e. they are pulled to migrate. In these models, migration occurs until wage equalization is realized – offsetting arbitrage.

According to Todaro (1969), two forces influence rural-urban migration, notably; the potential for gaining higher income from urban employment than the rural employment, and the probability of securing such a job in the urban sector. This does not mean that as one migrates from the rural to urban hopes to secure a job in the modern urban sector right away but thinks about the possibility of getting recruited into some position even if it takes time. Literature considers Todaro's approach as the pull-factors model, while the other dimension centres on the push-factors inherent in the rural situation of poor standard of living. Some of the pull factors commonly mentioned include high pay, quality of housing, access to amenities, safer atmosphere, steady economy, possibility of greater wealth and affluence, just to mention a few. On the other hand, some of the rural push factors commonly mentioned are poor services, lack of adequate amenities, poor housing and infrastructure, natural disasters and poverty at large. These remain as factors that leave one with no choice but to depart from the rural location (Singh and Agarwal, 1998; Stiglitz, 1973; Shaw, 1974).

In our paper, we take an economic pull factor of real income differential as the main force we want to examine first since a significant number of people in the urban traditional sector of the developing countries are still poor. This means their movement to urban centres is likely to be

contributed by the pull income factor of better survival in urban than in rural areas (Lucas, 2004). Further, resolving income problem can make solution to several other migration factors, both push and pull (Alvarez-Cuadrado, et al., 2011; Rémi et al., 2014). It can be difficult for the relatively better income earners in the rural to migrate to urban areas since for them, urbanisation is likely meant an opportunity to be harnessed for improved income in the rural through forward and backward linkages. On one hand, expansion of urban areas creates employment opportunities for the rural educated, skilled and semi-skilled workers who are seeking for jobs, and thus can increase migration of rural people to urban areas. Nevertheless, urbanisation may also reduce migration of rural workers to the urban areas: first, it can create employment opportunities in rural nonfarm and farm activities through generation of demand for rural products; and second, as urbanisation increases, it raises cost of living that can put pressure on the carrying capacity of urban basic infrastructure and amenities, thus discouraging migration to urban.

Mabogunje's (1970) regards migration as a system and models it as some dynamic spatial process. Mabogunje underscores sub-systems of control to migrants: (i) rural sub-system, which has control on outflows of people regarding a number of factors like family and social ties, norms and so forth; and (ii) urban sub-control system, which has control on inflows of people through employment agencies that give feedback to potential migrants, as well as other background factors like social and economic situations, infrastructure, regulations, etc. This view is embraced and broadened by other authors, including Kritz and Zlotnik (1992).

Existing institutions, demographic factors like high birth rates and other non-economic factors have also been considered as relevant for migration (Hollifield, 2000; Zelinsky, 1971; Zolberg, 1981). In some countries, there can be restrictions limiting migration while in some others mobility is in the liberty of the citizens to move and dwell where they prefer. Because freedom is counted as one of indicators of modernisation, migration of people has also been contextualized as a result of transformation process to modernity. These arguments seem somewhat vague in content as they lack strong reasons for different types of migration but make sense from the social point of view that people may move from rural to urban areas for various reasons including non-economic ones. The government slogans, motivations and persuasions can be part of reasons people would either migrate or not.

From micro-level decision making, migration theory has focused on individual's decision making based on cost-benefit analysis in both economic (income) and non-economic gains and losses (Lee, 1966 and Sjaastad, 1962). In this view, migration is the individual's investment decision to maximize human capital productivity. A migrant would find the net discounted value/return of migration over the future periods, and so migrate only when the expected net returns are positive. The discount is done over the life time, and thus the younger and the more educated the higher would be the present value of returns from migration. This model is pedagogically appealing and insightful, but can be criticised on the ground of its abstraction since it may be difficult to test it empirically. Nonetheless, it is correct that migrants would not move from rural to urban areas without having some thought about *gain* and *loss* of migration (Fischer, et al., 1997).

The New Economics of Labour Migration (NELM) has, however, taken a different context of migration as a matter of household's decision (Harbison, 1981 and Morokvasic, 1984). There are cases where a family strategy to raise returns would influence migration of some members to work

in urban areas as maids or houseboys. The decision to migrate is thus made by the household members together for their welfare, and they often agree on expected remittances³. This view has implication that poverty could be a reason for the family to strategize migration as resourceful (Massey, 1990). From the general context of migration factors, Hagen-Zanker (2008) conceptualises migration decision making and its effects in a logical framework (Figure 1). The framework that views migration as a wide concept, based on several causes and culminating into effects.

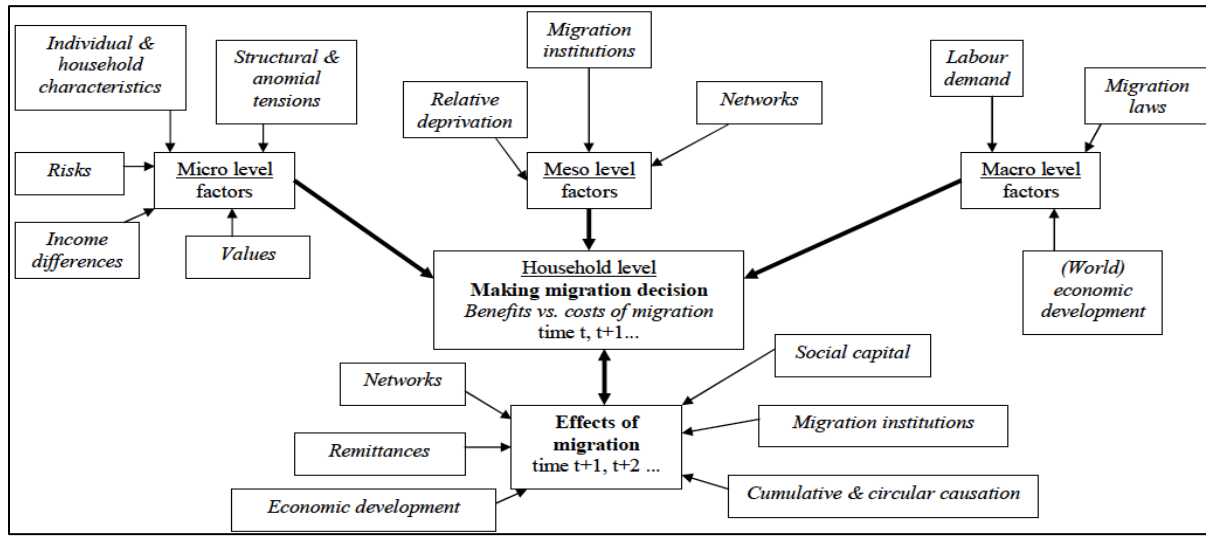


Figure 1: Migration decision making and effects framework

Source: Hagen-Zanker (2008)

At the lower level of the framework is a summary of the number of reasons rural-urban migration would occur. At the upper level, there are several factors contributing to decision making as indicated. These factors may not be necessarily operating simultaneously, but at least some of them should influence decision of the potential migrants.

Stock and flow of migration: migration stock means total number of migrants at a particular point in time, while flow captures increment to the existing stock in a given period (Lianos 1970). Lianos model assumed that flow of migration during the period is linearly related to the stock of migration existing during the same period. The Lianos model suggests that the process of migration is logically sequenced where the stimulating factor to migrate is earnings differentials between the origin and destination (O’Rourke, 1972).

The other question, but with possibility of an ambiguous answer is on whether rural-urban migration propels urbanisation, or is the other way around, that urbanisation process accentuates and causes migration (Henderson, 2010; Yuki, 2007; Poelhekke, 2010; Gollin, Jedwab and

³ There is always a bargaining process and in case the migrant has low bargaining power, he/she can be forced to migrate even if is not willing, and the amount of remittance to be transferred back to the family is predetermined in their negotiation.

Vollrath, 2016). In attempt to achieve the two objectives⁴ of the paper, this question can get an answer for the case of Tanzania.

On whether migration and urbanisation have positive implications to economic development, there has been a number of contradicting views. There are those who think that urbanisation is a problem especially for developing countries and that it would be better for people to remain in rural areas to use land for agricultural production, while on the other hand, there are those who have argued for positive impact of urbanisation to economic development even for the developing countries (Quigley, 2009; Todaro and Smith, 2009). The argument is made, that if urban areas had less to give in terms of welfare in developing countries, then migrants would rationally revert back to their former rural dwellings. Nevertheless, the major point revolves around making the best out of migration, i.e. migration that creates a noticeable push to economic development through assured jobs creation and the increased labour productivity (Todaro and Smith, 2009; Storper, 2014).

Potts (2016) compares urbanisation and economic growth in Zambia and Zimbabwe and she finds that in both countries urbanisation was driven by economic factors as it followed economic growth except where some draconian restrictions were put on migration. In China urbanisation has been associated with both urban pull and rural push factors. As labour transforms into skilled status in the rural and income disparity between rural and urban increases, there is more incentive for migration from the rural side push factors while growth and agglomeration economy pull migrants to urban at the same time (Liu and Zhang, 2003). China puts restraints on migration and urbanisation as the economy grows, otherwise, urbanisation rate of the country could be quite high.

Tacoli, et al. (2015) show that from 2000 to 2010 migration accounts for about one third of urban population growth in sub-Saharan Africa. While there can be several reasons for migration, work in private households is among the major sources of employment for rural-urban migrant women in Tanzania (Mabala and Cooksey, 2008). Income in the rural areas is low and economic choices are limited. For this reason, income disparity has been one of the factors for migration in the country. However, the paper does not ascertain the income differential between the rural and traditional urban sector, which is part of the focus of our paper.

Msigwa and Mbongo (2013) examine the determinants of residents' inter-regional migration in Tanzania by using a multinomial model. Their findings show that rural-urban migration is dominated by young adults; and high levels of school completion are positively correlated with the probability of migrating to urban areas. The findings further point out that income differences and less motivation in rural areas are among the contributors to migration. The trend is characterized by more male migrants than females, and 'less or no skills at all' making their penetration to the modern labour market almost impossible.

Wenban-Smith (2015) shows that in Tanzania urbanisation does not seem to create as much value economically as it is for Asia. The findings show that urbanisation of large cities is associated with migration triggered by both economic and institutional factors. However, Wenban-Smith does not

⁴ The second objective of this study intends to investigate whether rural-urban migration is associated with unemployment in traditional urban sector. If unemployment is due to the natural growth rate of the urban labour force, then rapid urbanisation is not on account of migration, but if it owes to flow of people from rural to urban centres, then rapid urbanisation is pressured by influx of immigrants.

look into the relationship between urbanisation factors and unemployment. Economic value of urbanisation is only likely to be created in a case where migration goes consistently with industrial/modern jobs creation in urban areas. While regional propensities for in-migration and out-migration in Tanzania were well established by Wenban-Smith (2014), the gap that seems to have remained in analyses of rural-urban migration in Tanzania is how significantly in-migration and out-migration relate with urbanisation and urban unemployment, for example. We want to not only understand the magnitudes of these measures but also to analyse significance of their effects on dependent variables as they influence urbanisation and urban traditional sector unemployment.

A case study of Kagera region in Tanzania by Beegle et al. (2011) explores the extent to which rural-urban migration has contributed to improved standard of living, using panel survey data of 1991 – 2004. Among the key findings was that the average consumption of individuals who migrated rose by more than four times of those who did not migrate in Kagera. Also, those who had moved out of Kagera by 2004 experienced consumption growth that was ten times greater than the growth of those who remained in their original community. These findings show a high dividend of movement, despite some households and communities own barriers to movements, which caused some potential migrants to remain in the rural areas. With such welfare gains it means migration should keep on happening because rationally, people will tend to compare benefit and cost of migration to make decision. According to Tanzania Human Development Report (2014), the perceived or actual lack of employment opportunities in rural areas is the main reason for rural-urban migration. The point here is actually about limited opportunities in the rural areas and thus low income and poverty are the driving force to migration.

3. Methodology

In the first place, we are interested in understanding important factors (including income differential) influencing rural-urban migration in Tanzania; and then to know implication of migration on urbanisation and unemployment in the urban traditional sector. We use pooled cross section data⁵ drawn from three census surveys; 1988, 2002 and 2012. Intercensal migration propensities are computed from differences across the 3 periods.

The first regression is on regional urbanisation rate (*urrate*) against the respective regional rural-urban income per capita differential (*y_{dif}*), urban in-migration propensity (*propin*), urban out-migration propensity (*propout*), and distance from the city⁶ (*dist*) as explanatory variables. This is from the hypotheses that; urbanisation is positively influenced by income differential and urban in-migration, while urban out-migration and distance from the major city reduces the rate of urbanisation. Distance interpretation is such that the closer is the regional centre to a metropolitan

⁵ Use of pooled cross section data has advantages and disadvantages, however, we see the advantages offsetting disadvantages for this case. The advantages include, among others, enlargement of the sample; offsetting the problem of temporary/periodic non-variability of national statistics; and the possibility to capture not only the variation of what emerges through time or space, but the but the variation of these two dimensions simultaneously. A notable disadvantage could only be a concern if we were using error component model under panel regression as there could be a possibility of correlation between cross-sectional and/or time period characteristics and included explanatory variables, which would be resolved by an option to either use fixed effects or random effects model depending on Hausman's test results.

⁶ In this case, we take Dar es Salaam as the outstanding metropolitan to which immigration can be substantial from all over the country's rural, and the distance is measured *in kilometres* from the respective regions.

city the more likely is its rate of urbanisation owing to the metropolitan's influence and thus the more it is attractive to immigrants⁷.

$$rrate = \alpha_0 + \alpha_1 y_{dif} + \alpha_2 propin + \alpha_3 propout + \alpha_4 dist + \varepsilon. \quad (1)$$

(*urrate*) is established from the population and housing census, y_{dif} is a variable measured as the difference between rural and urban incomes approximated from employment and earning surveys. It is a difference between the regional rural and urban per capital incomes. Both *propin* and *propout* are computed from the census data. By construction, propensities (in/out) are measured as the respective ratios of 'in' or 'out' migration to the total urban population plus its exponential growth.

While these factors are hypothesised as determinants of urbanisation rate, we assume an important symmetry between urbanisation and urban traditional sector unemployment. So, it is also important to understand whether the same explanatory factors verify such identity, i.e. whether as they determine urbanisation rate they do similarly influence urban traditional sector unemployment (*urunemp*), and to the same direction. The second regression equation contains the same regressors but against urban traditional sector unemployment as the dependent variable. Unemployment variable, *urunemp*, is constructed from the census working age population distribution, i.e. the number of unemployed people in the respective traditional urban centres.

$$urunemp = \beta_0 + \beta_1 y_{dif} + \beta_2 propin + \beta_3 propout + \beta_4 dist + \varepsilon. \quad (2)$$

One of important questions is in case there is significant relationship between urban in-migration and unemployment in the traditional urban sector in the country. It is by definition that unemployment figure counts the joblessness of the potential workforce, whose number should be scaled up if there is urban in-migration amid the naturally created labour force. However, this is not automatically conclusive that traditional urban unemployment should be a result of in-migration because there could be a possibility of urban unemployment as a function of lower rate of industrial/modern jobs creation than even the natural growth rate of urban population; or putting it the other way, urban unemployment might not be there if the rate of jobs creation in urban centres was high enough to offset employment pressure exerted by both in-migration and natural rate of population growth. We can check endogeneity between urbanisation rate and urban traditional sector unemployment. If urbanisation rate is endogenous to traditional urban sector unemployment, and not the other way around, it means we conclude that the right-hand side variables of these equations explain both urbanisation and unemployment. That is, just as they influence urbanisation speed, urban traditional sector unemployment pressure responds accordingly.

Regarding estimation procedure for these equations, different approaches can be used depending on the properties of the data. If assumption of normal distribution of errors holds, it means we can estimate simple linear regressions. Otherwise, if there are minor problems about normality, heteroscedasticity or some observations exhibit large residuals we can resort to either non-parametric estimation by bootstrapped sample or we do the regression with robust standard errors (using the Huber-White sandwich estimators). considering the advantages and disadvantages of

⁷ This is in the context of the relative ease to deal with the big city for better income and associate relative access to good services and amenities, *inter alia*.

non-parametric⁸ regressions, we would opt for the regression with robust standard errors in cases of such minor problems.

4. Descriptive statistics and variables diagnostics

Except for the changes that were computed between the censuses 1988, 2002 and 2002, the variables are pooled for two census periods 2002 and 2012. A quick picture of the means of variables is depicted in Table 2.

Table 2: Means of analytical variables

Variable	Obs	Mean	Std. Dev.	Min
Urbanisation rate	40	23.7	18.4	6.2
Urban unemployment (<i>number</i>)	40	294,362.0	409,978.3	84,994.9
Per capita income differential (<i>Tsh. amount</i>)	40	305,389.9	282,550.0	93,576.0
Propensity of in-migration	40	34.1	31.9	(12.8)
Propensity of out-migration	40	3.5	22.8	(49.8)
Distance	40	683.4	383.9	0

Note: Urban unemployment specifically means, ‘urban traditional sector’ unemployment.

The country’s average urbanisation rate was 23.7 percent, rising from 21.4 percent in 2002 to 25.9 percent in 2012, led by Dar es Salaam which reached 100 percent from 93.9 percent. Tanzania Mainland rate of urbanisation has more than doubled during the past four decades since independence (see *Appendix, I*). With such speed, urbanisation has consistently increased urban traditional sector employment, which increase nationally by 38.8 percent in a decade, from a total of 4.9 million in 2002 to 6.8 million people in 2012. Average per capita income differential was at Tsh. 305,389.90, with Dar es Salaam registering the highest differential of Tsh. 1,604,291.10 in 2002 and Tsh. 2,310,666.50 in 2012. It is worth noting that, there was a high positive correlation between per capita income differential and the rate of urbanisation (Table 3). This simply means the two variables evolved concurrently and to the same direction. Nonetheless, even if the cause-effect relationship between urbanisation and rural-urban per capita income differential is known, a question still remains as to what is the mechanism by which per capita income differential, for example, drives urbanisation. Of course, one of the appealing ways it could be through high urban per capita income which attracts potential immigrants to leave rural areas for the traditional urban sector. Regional average propensity of urban in-migration was much higher than the corresponding average propensity of urban out-migration during 1988-2012, indicating an overall positive net rural to urban migration (Figure 2).

⁸ Non-parametric estimation has advantages in that it can work with relatively small sample and it does not demand prior assumptions of normality and the hypothesized parameters the variable. Nonetheless, a major issue would be lack of statistical power if the assumptions of a roughly equivalent parametric test are valid. Although we are not interested in the long debate about comparability of these two approaches, familiarity of parametric approaches in statistical analyses, and non-familiarity of non-parametric approaches support a reason that put our preference for parametric analysis on the top of non-parametric approach at least for this case.

Table 3: Correlations coefficients of the variables

	Urbanisation rate	Urban unemployment	Per capita income differential	Propensity of in-migration	Propensity of out-migration	Distance
Urbanisation rate	1.00					
Urban unemployment	0.95	1.00				
Per capita income differential	0.88	0.95	1.00			
Propensity of in-migration	0.12	0.11	0.04	1.00		
Propensity of out-migration	0.65	0.64	0.70	(0.04)	1.00	
Distance	(0.52)	(0.38)	(0.38)	0.18	(0.54)	1.00

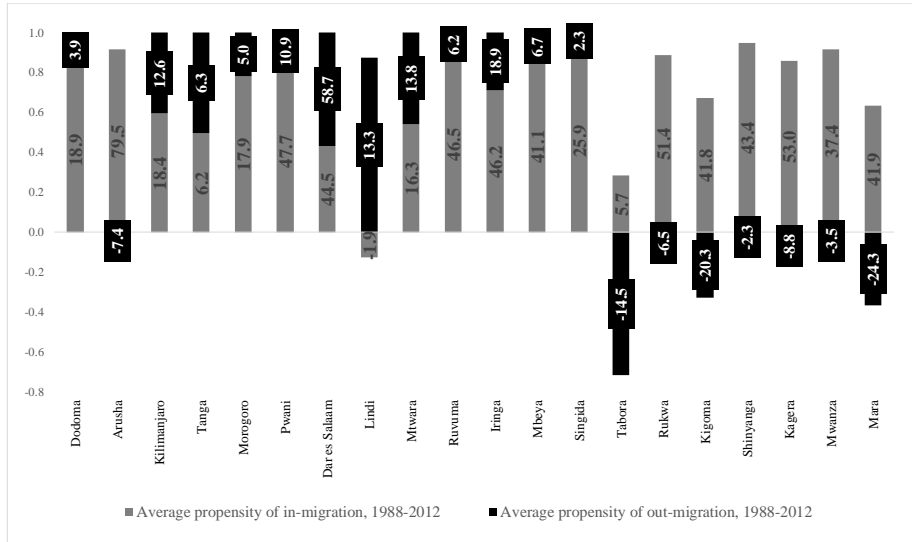


Figure 2: Average urban in-migration and out-migration propensities, 1988 – 2012

For the tests and estimation purpose, per capita income differential and number of urban traditional sector unemployment (which are in millions of shillings) are transformed into logarithm to scale them down and avoid unnecessary skewness. The other variables are rates/ratios and the distance from the Dar es Salaam metropolitan which are not too large to weaken statistical distributions. On whether these variables and their residuals are normally distributed, the bivariate (paired) normality and multivariate (combined) normality tests are done using a variety of the approaches, namely; Mardia *mskewness*, Mardia *mkurtosis*, Henze-Zirkler and Doornik-Hansen to make a general conclusion on normality status (see *Appendices 2, 3 & 4*). Looking at the variables one by one, all are not normally distributed, except for the per capita income differential and urbanisation rate. The pair-wise normality is not observed for all pairs of the variables except the one for per capita income and distance. All multivariate tests of normality make a general conclusion that residuals of the specified regressions are not normally distributed. Therefore, is inappropriate to simply estimate simple OLS regressions.

The other problem of concern for cross section data is a possibility of heteroscedastic variances. For both estimation equations, we run simple OLS regression, respectively; and then predict residual series whose squared values are regressed against the independent variables as the first step; and next the same are regressed against their respective fitted dependent variables, and their respective squared values to ascertain the presence of heteroscedasticity. The problem of heteroscedasticity is detected for regression equation (1) and if it is tested from the dependent

variables context, heteroscedasticity still remains (see *Appendices 5 & 6*). However, the same tests for the second regression equation (2) relating urban unemployment and the explanatory variables confirm that there is no problem of heteroscedasticity (see *Appendices 7 & 8*). When we finally explore the problem from the dependent variable's context, the variables are homoscedastic. Therefore, the results are mixed, i.e. the model of urbanisation rate is homoscedastic while the other model of urban traditional sector unemployment is heteroscedastic.

The other important test is done to check endogeneity between the two estimation equations' variables. We apply 2SLS approach with quality instruments; and the test is done using both Durbin chi-square and Wu-Hausman F-statistic. A summary of endogeneity status of the two models is presented in *Appendix 9*. While urbanisation rate is generally exogenous to urban traditional sector unemployment model; the latter is, however, endogenous to urbanisation rate model (from both Durbin chi-square and Wu-Hausman F-statistic criteria).

In light of these results, it is appropriate to use 3SLS techniques of simultaneous equations regression rather than a simple OLS regressions. We therefore combine estimation equations (1 and 2) to make a reduced form of the simultaneous regressions, equation (3) that we estimate. This formulation corrects adequately the observed minor problems in the preceding tests.

$$\begin{cases} rrate = \delta_{01} + \delta_{11}\ln(y_{dif}) + \delta_{21}propin + \delta_{31}propout + \delta_{41}dist + \vartheta_1 \\ \ln(urunemp) = \delta_{02} + \delta_{12}\ln(y_{dif}) + \delta_{22}propin + \delta_{32}propout + \delta_{42}dist + \vartheta_2 \end{cases} \quad (3)$$

5. Regression results and discussion

As shown by the chi-square statistics, regressions are generally significant at 1 percent level. This means explanatory variables (rural-urban per capita income differential, propensity of in-migration to urban centres, distance to the urban centre from Dar es Salaam metropolitan and propensity of out-migrate to rural areas) do influence urbanisation and/or urban unemployment in Tanzania Mainland.

Table 4: Three-stage least-squares regression of urbanisation and unemployment models

Equations	Obs	Parms	RMSE	R-sq	chi2	P
Urbanisation rate	40	4	10.291	0.6791	84.660	0.0000
Urban unemployment	40	4	0.4930	0.4781	36.650	0.0000

Urbanisation rate						
	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Per capita income differential	15.60207	3.283598	4.75	0.0000	9.16634	22.0378
Propensity of in-migration	0.177988	0.054638	3.26	0.0010	0.07089	0.285077
Propensity of out-migration	0.073684	0.111166	0.66	0.5070	-0.14419	0.291566
Distance	-0.018266	0.005284	-3.46	0.0010	-0.03653	-0.00790
Constant	-163.1801	40.43678	-4.04	0.0000	-326.360	-83.9254

Urban unemployment						
	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Per capita income differential	0.574005	0.157317	3.65	0.000	0.265668	0.88234
Propensity of in-migration	0.007126	0.002617	2.72	0.006	0.001995	0.01226
Propensity of out-migration	0.001675	0.005326	0.31	0.753	-0.00876	0.01211
Distance	-0.000364	0.000253	-1.44	0.150	-0.00086	0.00013
Constant	5.13826	1.937333	2.65	0.008	1.341158	8.93536

In respect of the urbanisation model, all explanatory variables are significant, save for the urban out-migration which is insignificant. Rural-urban per capita income differential is significant and has the hypothesised positive sign. As income difference increases (i.e. higher income in urban centres than in rural areas) people migrate to urban centres with anticipation of making better earning. Migration is evident from the data since population in the urban during each census period was generally more than it should have been if it were growing by only its natural growth rate from the recorded pervious rate, while in the rural areas population was at the lower level than it would have been if it grew by the natural rate (see *Appendix 10*).

Propensity of urban in-migration is positive and significant and this confirms the hypothesis that urbanisation has been largely emanating from rural to urban migration in Tanzania Mainland. Urbanisation is not actually bad except the rate of urbanisation is inconsistent with jobs creation in the modern urban sector. Inconsistency is often manifested by hiking unemployment as urbanisation continues. In our study this issue is addressed using the second equation.

Distance to Dar es Salaam is negative and significant, which implies that the closer to Dar es Salaam a regional centre is, the more urbanised it happens to be. Dar es Salaam is the largest city of Tanzania that is now 100 percent urbanised, followed by the other urban centres that are relatively near, while most of the distant regional centres are less urbanised. This implies further that Dar es Salaam growth has urbanisation spill-over effect on closer (or easily accessible) regions. Once urbanisation is triggered, other factors including rural-urban migration tend to enhance its growth in addition to the own urban population natural growth rate.

The second estimation equation analyses relationship between urban traditional sector unemployment and the explanatory variables in the model. Two independent variables are significant; per capita income differential and propensity of urban in-migration, while the urban out-migration and distance are insignificant for this model. Rural-urban per capita income differential is positive and significant as hypothesized. The higher the income differential between urban and rural areas the more unemployment is observed. There can be one main reason for this,

that high income differential in the country attracts more in-migrants than it is optimally viable for the urban jobs market. To support this argument, the results show that traditional urban sector unemployment varies directly with in-migration. This means in-migration influences urbanisation positively but without concurrent jobs creation in the modern urban centres.

6. Conclusion

Urbanisation and urban traditional sector unemployment in Tanzania Mainland are the migration phenomena, and they are significantly driven by the rural-urban per capita income differential. The factors driving urbanisation are largely relevant for the urban traditional sector unemployment. Rural-urban per capita income differential and high propensity of in-migration are the main factors responsible for both urbanisation and unemployment in the urban sector. Further, the distance to Dar es Salaam city from the respective regions is inversely proportional to urbanisation rate in the country. This observation means the closer and more accessible is the regional centre from Dar es Salaam the more urbanised it is, and also the higher is its rate of urban traditional sector unemployment. Overall, as urbanisation increases across the country, so the urban unemployment rises. There is no sufficient evidence that urban out-migration was able to offset the effect of in-migration to thus moderate the speed of urbanisation. Absorption capacity of modern (industrial) activities in the urban centres is low as compared with the immigrants' influx, and this makes it a case that urbanisation is proceeding with concurrent increase in urban traditional sector unemployment.

Following these results, there is need to fast track rural development to raise rural income and to provide adequate services as a way to reduce urban in-migration, and possibly to encourage out-migration to rural economy. As the rapid urbanisation continues, it is also important to expedite industrialisation process for creation of industrial jobs in the urban modern sector as a way to increase immigrants' absorption capacity. In order to enhance absorption of the immigrants, it is important to make sure the quality of the potential workers in the traditional urban sector (from which the selection takes place) is good enough to allow possibility of employment acquisition in the modern sector.

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APPENDICES

Appendix 1: Tanzania regional urbanisation rates, 1978-2012

Urban	Urbanisation (%)				Urban Population Growth		
	1978	1988	2002	2012	1978-1988	1988-2002	2002-2012
Dodoma	8.8	10.6	12.6	15.4	4.4	3.5	4.2
Arusha	8.0	12.1	23.4	24.1	8.3	9.0	3.3
Kilimanjaro	7.5	15.0	20.9	24.2	9.4	4.0	3.3
Tanga	14.1	17.6	18.4	21.6	4.5	2.1	3.9
Morogoro	14.4	21.0	27.0	28.7	7.1	4.1	3.0
Pwani	7.2	15.0	21.1	32.8	9.8	4.9	6.8
Dar es Salaam	91.3	89.6	93.9	100.0	4.6	4.8	6.5
Lindi	10.1	15.1	16.0	18.7	6.2	1.9	2.5
Mtwara	12.0	14.4	20.3	22.9	3.3	4.2	2.5
Ruvuma	7.7	11.7	15.2	24.6	7.7	4.5	7.2
Iringa	9.1	9.8	17.2	25.7	3.3	5.8	5.1
Mbeya	8.9	18.0	20.4	33.2	10.7	3.3	7.9
Singida	9.4	8.6	13.7	12.5	1.7	5.7	1.4
Tabora	13.1	14.3	12.9	12.6	3.3	2.8	2.7
Rukwa	11.7	14.1	17.6	25.1	6.4	5.2	7.0
Kigoma	9.9	12.3	12.1	17.2	5.0	4.8	6.1
Shinyanga	4.2	6.6	9.2	12.1	7.6	5.8	4.6
Kagera	3.4	5.3	6.2	9.9	7.3	4.4	8.2
Mwanza	10.2	18.1	20.5	28.3	8.7	4.2	6.4
Mara	7.3	10.5	18.6	17.4	6.6	6.9	1.8
Mainland	13	17.8	22.6	29.1	5.9	4.7	5.3

Source: Wenban-Smith (2014)

Appendix 2: Test for univariate normality

Variable	Pr(Skewness)	Pr(Kurtosis)	Joint	
			adj chi2(2)	Prob>chi2
Urbanisation rate	0.0000	0.0000	35.7500	0.0000
Urban unemployment	0.0001	0.0024	18.0300	0.0001
Per capita income differential	0.0951	0.7044	3.1400	0.2076
Propensity of in-migration	0.0017	0.0040	14.0600	0.0009
Propensity of out-migration	0.0021	0.0001	18.9200	0.0001
Urbanisation rate	0.8097	0.1675	2.0900	0.3513

Appendix 3: Doornik-Hansen test for bivariate normality

Pair of variables		chi2	df	Prob>chi2
Urbanisation rate	Urban unemployment	52.020	4	0.0000
	Per capita income differential	105.250	4	0.0000
	Propensity of in-migration	151.660	4	0.0000
	Propensity of out-migration	119.500	4	0.0000
	Distance	130.120	4	0.0000
Urban unemployment	Per capita income differential	14.4000	4	0.0061
	Propensity of in-migration	32.0000	4	0.0000
	Propensity of out-migration	37.0400	4	0.0000
	Distance	17.1900	4	0.0018
Per capita income differential	Propensity of in-migration	13.5200	4	0.0090
	Propensity of out-migration	55.0600	4	0.0000
	Distance	3.4400	4	0.4878
Propensity of in-migration	Propensity of out-migration	45.7800	4	0.0000
	Distance	11.9600	4	0.0177
Propensity of out-migration	Distance	30.1500	4	0.0000

Appendix 4: Test for multivariate normality

Mardia mSkewness =	25.0276	chi2(56) =	183.194	Prob > chi2 =	0.000
Mardia mKurtosis =	62.5525	chi2(1) =	22.060	Prob > chi2 =	0.000
Henze-Zirkler =	1.12935	chi2(1) =	16.619	Prob > chi2 =	0.000
Doornik-Hansen		chi2(12) =	98.922	Prob > chi2 =	0.000

Appendix 5: Squared residuals regression with independent variables, from equation (1)

Source	SS	df	MS	No. of obs	=	40
				F(4, 35)	=	4.45
Model	635691.979	4	158922.99	Prob > F	=	0.0052
Residual	1249408.49	35	35697.385	R-squared	=	0.3372
				Adj R-squared	=	0.2615
Total	1885100.47	39	48335.909	Root MSE	=	188.94
urrateres2	Coef.	Std. Err.	t	P> t	[95% Conf. interval]	
Per capita income differential	176.729	60.2846	2.93	0.006	54.3447 299.113	
Propensity of in-migration	1.592318	1.003119	1.59	0.121	-0.4441 3.62875	
Propensity of out-migration	-1.915242	2.040934	-0.94	0.354	-6.0585 2.22807	
Distance	-0.2134429	0.097016	-2.2	0.034	-0.4104 -0.0165	
Constant	-1982.741	742.3916	-2.67	0.011	-3489.87 -475.61	

Note: Dependent variable *urrateres2* is the squared series of predicted residuals from the urbanisation model, equation 7

Appendix 6: Squared residuals regression with dependent variable, from equation (1)

Source	SS	df	MS	No. of obs	=	40
				F(4, 35)	=	59.1
Model	1435700.75	2	717850.37	Prob > F	=	0.0000
Residual	449399.719	37	12145.938	R-squared	=	0.7616
				Adj R-squared	=	0.7487
Total	1885100.47	39	48335.909	Root MSE	=	110.21
urrateres2	Coef.	Std. Err.	t	P> t	[95% Conf. interval]	
Fitted urbanisation rate	-0.9946	0.2820	-3.53	0.0010	-1.56590 -0.42325	

Fitted squared urbanisation rate	0.0065	0.0008	8.12	0.0000	0.00489	0.00815
Constant	34.5192	23.1526	1.49	0.1440	-12.39248	81.43083

Appendix 7: Squared residuals regression with independent variables, from equation (2)⁹

Source	SS	df	MS	No. of obs	=	40
				F(4, 35)	=	0.65
Model	0.3015	4	0.0754	Prob > F	=	0.6282
Residual	4.0367	35	0.1153	R-squared	=	0.0695
				Adj R-squared	=	-0.037
Total	4.3382	39.0000	0.1112	Root MSE	=	0.3396
urtradres2	Coef.	Std. Err.	t	P> t	[95% Conf. interval]	
Per capita income differential	0.05818	0.10836	0.54	0.595	-0.16179	0.27816
Propensity of in-migration	-0.00045	0.00180	-0.25	0.804	-0.00411	0.00321
Propensity of out-migration	0.00221	0.00367	0.6	0.551	-0.00524	0.00965
Distance	-0.00002	0.00017	-0.11	0.913	-0.00037	0.00033
Constant	-0.4563	1.3344	-0.34	0.734	-3.16529	2.25273

Appendix 8: Squared residuals regression with dependent variables, from equation (2)

Source	SS	df	MS	No. of obs	=	40
				F(4, 35)	=	1.53
Model	0.3314	2	0.1657	Prob > F	=	0.2299
Residual	4.0068	37	0.1083	R-squared	=	0.0764
				Adj R-squared	=	0.0265
Total	4.33819	39.0000	0.11124	Root MSE	=	0.3291
urtradres2	Coef.	Std. Err.	t	P> t	[95% Conf. interval]	
Fitted urbanisation rate	0.0042	1.9890	0.0000	0.9980	-4.0259	4.0342
Fitted squared urbanisation rate	1.7040	3.2454	0.5300	0.6030	-4.8717	8.2798
Constant	0.1285	0.2896	0.4400	0.6600	-0.4582	0.7153

Appendix 9: Endogeneity tests for dependent variables

i. Test of endogeneity of urbanisation rate

Ho: variables are exogenous

Durbin (score) chi2(1) = 2.91999 (p = 0.0875)

Wu-Hausman F(1,35) = 2.75619 (p = 0.1058)

ii. Test of endogeneity of urban traditional sector unemployment

Ho: variables are exogenous

Durbin (score) chi2(1) = 20.5821 (p = 0.0000)

Wu-Hausman F(1,35) = 37.0982 (p = 0.0000)

⁹ Dependent variable *urtradres2* is the squared series of predicted residuals from the urban traditional sector unemployment model, equation 8.

Appendix 10: Tanzania Mainland's population of the studied regions

	Rural population					Urban population				
	Population	Exponential growth	Population	Exponential growth	Population	Population	Exponential growth	Population	Exponential growth	Population
	1988	1988-2002	2002	2002-2012	2012	1988	1988-2002	2002	2002-2012	2012
	A	B	C	E	F	G	H	I	K	L
Dodoma	1,104,115	349,971	1,478,782	468,729	1,762,394	131,162	41,574	213,243	67,592	321,194
Arusha	1,187,495	376,400	1,781,377	564,642	2,367,101	162,730	51,580	544,316	172,532	752,340
Kilimanjaro	938,449	297,460	1,088,611	345,057	1,242,712	165,619	52,496	288,091	91,316	397,375
Tanga	1,054,350	334,197	1,335,084	423,181	1,604,297	225,912	71,607	301,196	95,470	440,908
Morogoro	1,011,130	320,497	1,279,513	405,567	1,582,434	268,801	85,202	473,849	150,196	636,058
Pwani	540,961	171,468	698,156	221,294	738,297	95,221	30,182	186,861	59,229	360,371
Dar es Salaam	139,675	44,273	151,885	870,817	151,885	1,205,443	382,089	2,336,055	740,458	4,364,541
Lindi	545,247	172,827	661,228	209,589	707,603	97,117	30,783	126,396	40,064	162,049
Mtwara	761,117	241,251	895,942	283,986	979,350	127,765	40,498	228,539	72,440	291,504
Ruvuma	688,747	218,312	944,045	299,234	1,038,071	91,121	28,883	169,670	53,780	338,820
Iringa	1,076,464	341,206	1,234,560	391,318	1,221,097	116,376	36,888	256,332	81,249	422,256
Mbeya	1,210,205	383,598	1,642,183	520,522	1,809,298	266,012	84,318	421,145	133,490	898,112
Singida	725,351	229,914	938,081	297,343	1,199,936	68,536	21,724	148,667	47,123	170,701
Tabora	891,774	282,665	1,490,581	472,469	2,004,114	148,848	47,180	219,884	69,697	287,509
Rukwa	604,003	191,451	936,232	296,757	1,175,534	99,047	31,395	200,122	63,433	393,609
Kigoma	746,396	236,585	1,471,240	466,338	1,762,669	104,867	33,240	202,807	64,284	365,256
Shinyanga	1,647,870	522,325	2,540,578	805,286	2,931,269	116,090	36,797	256,052	81,161	402,563
Kagera	1,244,182	394,368	1,901,407	602,688	2,543,717	69,457	22,016	126,750	40,176	279,433
Mwanza	1,536,781	487,113	2,328,387	738,028	2,818,823	339,995	107,768	601,257	190,580	1,113,222
Mara	852,853	270,328	1,109,791	351,770	2,188,823	99,763	31,622	253,606	80,385	303,412
Mainland	18,507,165	5,866,209	25,907,011	8,211,735	30,924,116	3,999,882	1,267,841	7,554,838	2,394,654	12,701,238

Source: Computation from census 1988, 2002, 2012