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## Horizontal inequality in education and wealth in Tanzania: A 20-year perspective

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# **Horizontal inequality in education and wealth in Tanzania**

A 20-year perspective

Emmanuel Maliti\*

October 2016

**Abstract:** This study uses five series of demographic and health surveys to answer the question: 'Is horizontal inequality in education and wealth increasing or decreasing in the 20-year interval between 1991 and 2010?'. Horizontal inequality in education attainment has been moving in waves; however, there was an inverted U-shaped trend where inequality increased between 2004 and 2007 before a declining trend in recent years. Unlike the fluctuating trends of the overall horizontal inequality in education, gender inequality in educational attainment has consistently been declining over time. The same consistent decline in education inequality is observed between urban and rural areas, and between the business city of Dar es Salaam and other sub-national regions. However, Tanzanian society is becoming more unequal in wealth with rising wealth inequality between geographical zones, gender, and also between rural and urban areas. This implies that, sub-national regions in Tanzania, men and women, and rural and urban areas are disproportionately benefiting from the impressive economic growth rates that Tanzania has experienced over the past decade.

**Keywords:** Tanzania, education, wealth, inequality, Gini, covariance, GTheil

**JEL classification:** I24, D310

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## 1 Introduction

Measuring inequality within and across countries, as well as its implications on different outcomes is receiving considerable attention in academic literature and among donors in the development field. As measurement techniques of inequality are advancing, a wealth of literatures have confirmed that inequality not only reduces potentials for future economic growth (Perotti 1996; Nissanke and Thorbecke 2006; Berg and Ostry 2011), but also constrains the speed at which poverty is reduced (Ravallion 1997, 2005; Thorbecke and Charumilind 2002; Nel 2006). In the wake of such evidence, it is no surprise that ‘reduce inequality within and among countries’ emerged as one of the 17 Sustainable Development Goals (SDGs) to guide international development efforts in the next 15 years. In addition to vertical inequality (inequality between individuals) which has over time dominated the literature, horizontal inequality is receiving growing interest (inequality between groups drawn along social identity lines, such as religious, regional, ethnic, and gender) (Stewart 2000). Such interest has, for instance, emerged from possible intersections between inequality in wealth and conflicts (Lipsky 1968; Gurr 1970; Bush and Saltarelli 2000).

There are five reasons why Tanzania needs to advance knowledge on inequalities and its consequences. First, poverty incidences have remained relatively high in Tanzania despite more than a decade of relatively strong and stable economic growth (Arndt et al. 2016). Notwithstanding a declining trend, 28.2 per cent of Tanzanians remain poor, more so in rural areas (33.3 per cent) than in urban areas (21.7 per cent) (United Republic of Tanzania 2012). Second, renowned economic reforms that were carried out in the early 1990s had considerable implications for the ways in which Tanzanians engage in economic and social activities. Reference is made, for instance, to the increasing economic freedom, with households experiencing a widening range of ways of engaging in livelihood activities. Third, one of the outcomes of the said reforms, included, among others, a significant rise in public and private investments in the social sectors of education and health. The government’s decision to abolish primary school fees in 2001 and the country-wide expansion of secondary education institutions raised the net enrolment ratio in primary school from 88.5 per cent (2003) to 97.3 per cent (2007), and in secondary education from 6.3 per cent (2003) to 33.7 per cent (2013) (United Republic of Tanzania 2013). Fourth, information, i.e. trends in inequality, to be generated by this study has the potential to influence government decisions on which areas need more public resources than others. The government could, for instance, increase spending in zones that are lagging behind in terms of access to education. Such policy moves could address historical zonal differences (pre-independence differences in education facilities) in a governance environment where public finances are highly centralized.

Using the five series of the Demographic and Health Survey (DHS) (1991, 1999, 2004, 2007, and 2010), this study therefore assesses the extent and evolution of educational and wealth inequalities at the sub-national level in Tanzania. With DHS lacking data on income and consumption expenditure, the study uses the wealth index directly provided in the DHS. The study primarily answers the research question: ‘Is inequality in education and wealth increasing or decreasing in the 20-year interval between 1991 and 2010?’. Standard international sources on ethnic diversity list Tanzania as among the most ethnically diverse countries in the world. Alesina et al. (2003), for instance, calculate linguistic fractionalization for Tanzania at 0.8983, the third highest in the world after Uganda (0.9277), and Liberia (0.9038). Nevertheless, ethnicity is generally considered to be less salient and less politicized than in many other sub-Saharan African countries (Miguel 2004; Bratton et al. 2012; Malipula 2014). In Tanzania it is difficult to carry out a national level analysis of horizontal inequality focusing on religious and ethnic diversity. This is mostly because ethnicity is a politically charged topic in Tanzania and thus

national surveys, including DHS, and censuses do not compile data on ethnic heterogeneity. This is a deliberate policy measure to deny politicians a chance to use statistics as a tool to create ethnic or religious tensions. Despite data limitations in directly investigating horizontal inequalities, it is possible to use the existing national survey to analyse regional/geographical inequalities, for instance in education and wealth. For the purpose of this study, geographical zones as defined in DHS datasets are treated as groups. Consideration of regions as groups has also been advocated in the literature as being consistent with the concept of horizontal inequality (see for instance, Stewart et al. 2010)

The paper is organized as follows. The next section presents a brief review of the literature on inequalities in Tanzania including identification of gaps that this study intends to fill. Section 3 describes the data used to compute different measures of inequality. It is followed by section 4 on methodical approaches. Section 5 discusses results, while section 6 concludes.

## **2 A brief survey of literature on horizontal inequality and sub-national disparities in Tanzania**

Improved data availability (population censuses, household budget surveys,<sup>1</sup> DHS, etc.) and innovations in poverty indices (Progress out of Poverty Index (PPI), multi-dimensional poverty index, wealth indices, etc.) as well as advancing statistical methodologies (poverty mapping etc.) have all encouraged analytical exercises on both vertical inequalities (inequalities between individuals or households) and geographically disaggregated poverty data in Tanzania.

### **2.1 Poverty mapping**

The breakthrough in disaggregating poverty data (per capita consumption) came when the United Republic of Tanzania (2005) used Elbers et al.'s (2003) poverty mapping methods to generate sub-national poverty estimates.<sup>2</sup> The results were far superior to the 2001 sub-national poverty estimates which lacked statistical representation at the sub-national level. The REPOA study was also advanced compared to contributions from Demombynes and Hoogeveen (2007), Mkenda et al. (2004), Hassine and Zeufack (2015), and World Bank (2015), which ended with poverty estimates at the rural/urban level. REPOA's contribution revealed per capita consumption inequalities with as much as a 40 percentage point difference between the poorest region (i.e. Mara, 50 per cent) and the region with the lowest poverty incidence (Dar es Salaam, 19 per cent). The results were therefore more of a baseline, and since then there has been no follow-up study to reveal trends over time. Whereas REPOA's study used per capita consumption, this study uses assets as a proxy for wealth.

### **2.2 HBS analytical reports**

Reports from HBS series (1991, 1997, 2001, 2007, and 2012) offer extensive poverty data on income inequality. The series show progress in households' possession of consumer durables as well as some improvement in dwelling conditions across all wealth quintiles. However, the poverty estimates provided by the HBS survey data are disaggregated at only three levels: rural-urban, Dar es Salaam, and other urban. Such levels of disaggregation are limited and can possibly hide persistent and widening regional disparities (Hassine and Zeufack 2015). Notwithstanding

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<sup>1</sup> Currently being undertaken every five years.

<sup>2</sup> The methods generate sub-national poverty estimates by combining Household Budget Survey (HBS) 2001 data with individual population data from the national census 2012.

limited disaggregation, HBS reports are less interested in household ownership of assets, an important socio-economic aspect that differs from income measures of poverty, which is prone to measurement error and reporting biases. The HBSs are consumption-based surveys that exclude expenditures on durable goods, and it is therefore more likely that inequality is much higher than what HBS reports (World Bank 2015).

### **2.3 Poverty-related studies with geographical disaggregated information**

The multi-dimensional poverty index (MPI) of the University of Oxford is another attempt to disaggregate poverty data to sub-national levels. Using data from DHS 2010, the MPI has revealed more alarming ‘multi-dimensional’ poverty incidences than the poverty mapping exercise and HBS reports. Dodoma was found to be the poorest region with an 83 per cent poverty incidence, 57 percentage points higher than Dar es Salaam whose poverty incidence stands at 26 per cent. The most recent paper with geographical inequalities data in Tanzania comes from Hassine and Zeufack (2015). Using the three series of HBS (2001, 2007, and 2012), the paper reveals increasing inequalities between education groups as well as a widening gap between rural and urban areas. For instance, the authors find an increasing welfare gap between the rural and urban areas of over 9 percentage points between 2007 and 2012 and this has more than tripled from the situation in 2001. However, the paper is constrained by the limitations of the HBS discussed above (geographically restricted disaggregation). This study has an edge over MPI and Hassine and Zeufack (2015) by covering a longer horizon of 20 years, revealing whether Tanzanian society is becoming fairer or less fair from the perspective of wealth and education across an extensive sub-national disaggregation.

## **3 Data**

This study draws on five DHS datasets spanning over two decades from 1991 to 2010 and consisting of a range of questions on education levels and ownership of assets. Despite DHS’s relative drawbacks (it is a survey rather than a much preferable census data), it includes many benefits including wider sub-national disaggregation of survey data than, for instance, HBS. The DHS data are second best to census data, which could not be obtained.

DHS are designed to provide representative estimates at the national and geographical zonal levels. The 2007 series was the Tanzania Malaria Indicator Survey (TMIS), which luckily enough measured a number of variables (including education and asset ownership) in a similar fashion as the original DHS, and adopted the same zonal classification as the 2004 and 2010 DHS. Among various demographic and health-related variables, all DHS series enquired about households’ education status and asset ownership. The DHS 2004, 2007, and 2010 shared similar zonal classifications, while DHS 1991 and 1999 maintained a slightly different classifications (Tables 1 and 2). Though specific reasons for changes in zonal classification between 1991 and 2004 were not given, it can easily be observed that the classification in 2004 is an improvement on the one used in the first and second DHS. For instance, Zanzibar, whose history differs significantly from that of the Tanzanian mainland, was reclassified as a stand-alone zone in the third, fourth, and fifth DHS. In the previous DHSs, the island was mixed up with other regions from the Tanzanian mainland. It was impossible to standardize the two different classifications as such a move would have made data for some of the zones unrepresentative. The reclassification therefore makes it difficult to directly infer trends from the first DHS to the last one in 2010. However, we can look at the trends in two phases—Phase 1: trends in inequality between 1991 and 1999 (the first 10-year period), and Phase 2: trends in inequality between 2004 and 2010 (the other 10-year period).

The DHS datasets contain number of years of schooling for each member of the surveyed households and wealth index. The wealth index in the DHS was constructed using information on households' ownership of assets such as cars, bicycles and televisions as well as materials used to construct the house, source of drinking water and type of sanitation facilities (United Republic of Tanzania 2010). Asset ownership fits well within the concept of human wellbeing and has frequently featured in literature on growth, poverty, and inequality (Persson and Tabellini 1994; Birdsall and Londofio 1997; Deininger and Squire 1998; Ravallion 1997; Deininger and Olinto 2000). Each asset was assigned a weight (factor score) generated through principal component analysis (United Republic of Tanzania 2010). The wealth index that is based on asset ownership is consistent with an understanding that households' wellbeing is closely related to wealth where asset-rich individuals are considered to have more opportunity to meet their needs (Smits and Steendijk 2015).

Table 1: Zonal classification: DHS 2004, 2007, and 2010

Zone	Regions
Western	Tabora, Shinyanga, Kigoma
Northern	Kilimanjaro, Tanga, Arusha, Manyara
Central	Dodoma, Singida
Southern Highlands	Mbeya, Iringa, Rukwa
Lake	Kagera, Mwanza, Mara
Eastern	Dar es Salaam, Pwani, Morogoro
Southern	Lindi, Mtwara, Ruvuma
Zanzibar	Unguja North, Unguja South, Town West, Pemba North, Pemba South

Source: United Republic of Tanzania (2004, 2007, and 2010).

Table 2: Zonal classification: DHS 1991 and 1999

Zone	Regions
Coastal	Tanga, Morogoro, Coast, Dares Salaam and Zanzibar
Northern Highlands	Arusha and Kilimanjaro
Lake	Tabora, Kigoma, Shinyanga, Kagera, Mwanza, and Mara
Central	Dodoma and Singida
Southern Highlands	Iringa, Mbeya, and Rukwa
Southern	Lindi, Mtwara, and Ruvuma

Source: United Republic of Tanzania (1991 and 1999)

## 4 Methodology

Three indices are used to presents trends in educational and wealth inequalities (see, for instance, Stewart et al. 2010; Gisselquist 2015). The first index is the Group-weighted Coefficient of Variation (Gcov) which is a common measure of regional disparities and primarily compares the mean of each group with the national average. Gcov is weighted by the population size of each group, so that changes in the position of small groups get less weight than those of larger groups.

$$GCov = \frac{1}{y} \left( \sum_r^R p_r ((\bar{y}_r - \bar{y})^2) \right)^{\frac{1}{2}}$$

The second measure is the Group-weighted Gini Coefficient (Ggini) which compares every group with every other group. It is based on the size of the differences between group averages of a variable under consideration and the group's relative population size (its share of population). The Ggini based on mean years of schooling can be interpreted as a measure of how concentrated the total stock of education is in any one group. A GGINI=0 would mean that all groups have the same mean years of schooling, while a GGINI=1 refers to a highly unequal situation where one group has exclusive access to all stock of education in Tanzania.

$$GGini = \frac{1}{2\bar{y}} \sum_r^R \sum_s^S p_r p_s |\bar{y}_r - \bar{y}_s|$$

The third measure is Group-weighted Theil (GTheil) which compares each group with the national mean. The GTheil captures the population-weighted ratios of the group mean to the national average for the variables under consideration, summing them up by dimension of inequality (UNICEF 2015).

$$GTheil = \sum_r^R p_r \frac{\bar{y}_r}{\bar{y}} \log \frac{\bar{y}_r}{\bar{y}}$$

Where

$\bar{y}_r = \frac{1}{n_r} \sum_i^{n_r} y_{ir}$	=	Zone $r$ mean value
$\bar{y}$	=	Sample mean of a variable under consideration
$y_{ir}$	=	Quantity of a variable under consideration of $i^{th}$ member of zone $r$
$\bar{y}_s$ of	=	Mean of a variable under consideration group $s$
$\bar{y}_r$	=	Mean of a variable under consideration of group $r$
$p_r$	=	Zone $r$ population share
$p_s$	=	Zone $s$ population share
$R$	=	Zone $r$ population size
$n$	=	Number of zones

Gcov and Ggini are the most promising measures of inequality since they do not involve subjective elements as in some other inequality measures (Stewart et al. 2010). Their limitation is that, they are less concerned with within-group inequalities (Jackson 2015). It is worth mentioning that the three statistics on their own do not tell much about inequality, but give a picture of how sub-national inequality in education and wealth is changing over time by comparing the statistics over a series of years. The same measures are repeated to compute gender disparities between men and women heads of households and by residence type (rural–urban disaggregation).

## 5 Results

### 5.1 Sub-national inequalities: education attainment

Table 3 presents changes in educational inequality over the past 20 years for those aged 15+ and 25+ years (bearing in mind that the two periods of analysis—1991 to 1999 and 2004 to 2010—



have different regional classifications). A general picture that is being displayed by the statistics is that, for both those aged 15+ and 25+ years, the inequality in education attainment increased between 1991 and 1999 and roughly declined thereafter (in the second part 2004–2010). The Gtheil index, for instance, which compares the value of each group with the national mean, displays similar and consistent trends for both those aged 15+ and 25+ years, i.e. inequality of education attainment increased between 1991 and 2007 before a sharp decline thereafter. However, by specifically observing the trends, the inequality in education attainment moves in waves, for instance, slightly different to those aged 15+ years, the 25+ year olds experienced declining inequality between 1991 and 1999 (Gcov and Ggini), with inequality increasing between 2004 and 2007 before declining thereafter.

Table 3: Aggregate measures of horizontal inequality in education

A. Years of education (15+)

		Region/ zone	Gender	Rural/ urban	Capital/ others
Gcov	1991	0.31673	0.22569	0.42978	0.52507
	1999	0.30468	0.16236	0.37404	0.41996
	2004	0.37380	0.15049	0.40394	0.50147
	2007	0.34680	0.14536	0.34680	0.41849
	2010	0.32405	0.12284	0.34312	0.36253
	Δ	+	-	-	-
Ggini	1991	0.06069	0.07967	0.10772	0.04821
	1999	0.06739	0.05726	0.10493	0.03955
	2004	0.06293	0.05311	0.10472	0.04566
	2007	0.06762	0.05127	0.08909	0.03836
	2010	0.05185	0.04336	0.08938	0.03307
	Δ	-	-	-	-
Gtheil	1991	0.00109	0.00002	0.00242	0.00089
	1999	0.00396	0.00002	0.00587	0.00081
	2004	0.00458	0	0.00511	0.00114
	2007	0.00712	0.00003	0.00327	0.0007
	2010	0.0028	0	0.00307	0.00036
	Δ	+	-	+	-

Note: Δ is change from 1991 to 2010. Data are graphed in Figures A1–A5 in the Appendix.

Source: Author's calculations.

# B. Years of education (25+)

		Region/ zone	Gender	Rural/ urban	Capital/ others
Gcov	1991	0.45199	0.42115	0.60775	0.81619
	1999	0.34935	0.27175	0.54662	0.44729
	2004	0.35022	0.23568	0.46252	0.60816
	2007	0.41710	0.22985	0.41754	0.54047
	2010	0.33455	0.18156	0.42290	0.33455
	Δ	-	-	-	-
Ggini	1991	0.08714	0.14870	0.15036	0.07437
	1999	0.07835	0.09589	0.12463	0.05132
	2004	0.06632	0.08320	0.11914	0.05530
	2007	0.07879	0.08107	0.10688	0.04958
	2010	0.05976	0.06406	0.10942	0.04365
	Δ	-	-	-	-
Gtheil	1991	0.00166	0.0006	0.00396	0.0019
	1999	0.00617	0.00004	0.00651	0.00102
	2004	0.00528	0.00021	0.00564	0.00144
	2007	0.0102	0.00039	0.00362	0.00082
	2010	0.0038	0.00003	0.0036	0.00054
	Δ	-	-	-	-

Note: Δ is change from 1991 to 2010. Data are graphed in Figures A1–A5 in the Appendix.

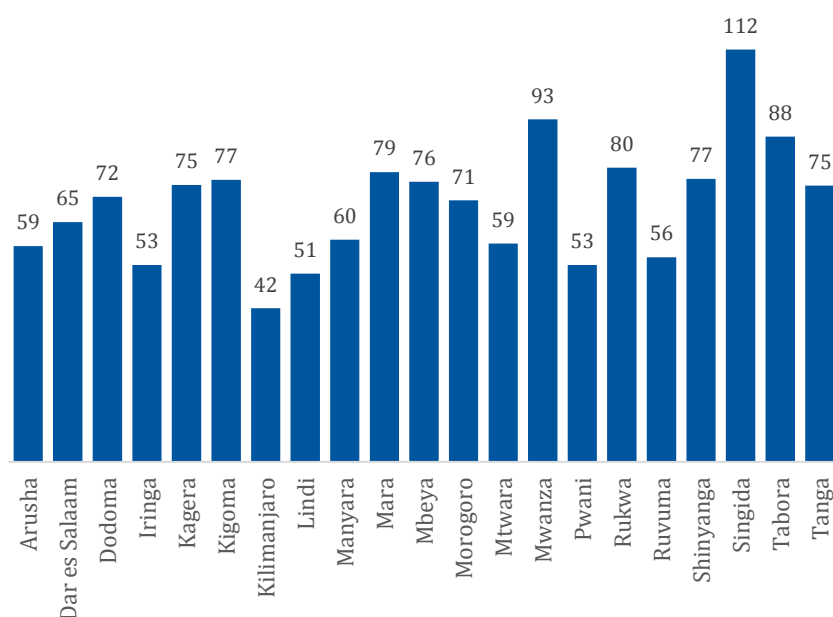
Source: Author's calculations.

Unlike the fluctuating trends of the overall horizontal inequality in education between 1991 and 2010, the gender differences in educational attainment have consistently been declining over time. Table 3 shows that the values for Gcov for those aged 15+ years and 25+ years have declined by more than a half between the periods under investigation. Gender inequality in education attainment for those aged 15+ years declined from 0.23 in 1991 to 0.12 by 2010. A sharper decline is observed for those aged 25+ years, from 0.42 to 0.18 over the same period of time. The Ggini values have also declined by more than half for both age groups. With such a trend, Tanzania is making significant advances in bringing about gender equality in access to education. Similar to the trends in gender inequality, the inequality between urban and rural areas and between the business city of Dar es Salaam and other sub-national regions has been consistently declining over the period under analysis.

The declining trend in education inequality in Tanzania in the later years of the analysis is consistent with the global trend that was observed by UNICEF (2015). For instance, in Sub-Saharan Africa, the regional mean has declined by more than half, from 0.17 in 1960 to 0.08 in the 2000s (UNICEF 2015). Tanzania, with a Gcov value of 0.32 in 2010 remains relatively educationally unequal to countries such as South Africa with a covariance value of 0.30 in 2011 (Lam et al. 2015). However, the Ggini index, which shows changes in the inequality trend for each group with respect to each other, shows limited disparities at Ggini equals to 0.05 in 2010 (for those aged 15+ years) and 0.06 (for those aged 25+ years). It is worth highlighting that unlike income, which has no ceiling, there is a natural maximum number of years of schooling one can attain in every educational system, and therefore as more individuals gain access to the mass education system, education becomes less concentrated in any one subgroup (UNICEF 2015). Regional inequalities in educational infrastructure is a possible factor behind the fluctuating inequality trends in education attainment. Figure 1 shows that the pupils per classroom ratio (a proxy for educational infrastructure) varies across regions with a standard deviation of 16 pupils per classroom. For the Government of Tanzania, such sub-national

differences in educational facilities and complementary infrastructure is an important area to consider when public resources are invested to expand access to education.

Figure 1: Sub-national variations in pupils per classroom ratio

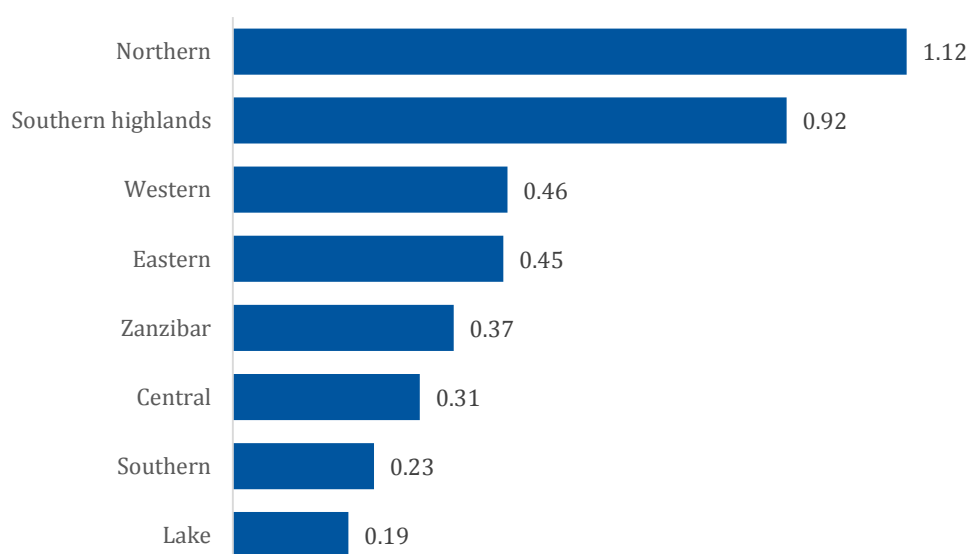


Source: Author's illustration based on United Republic of Tanzania (2012).

There are a number of reasons behind the recent declining trends in educational inequalities. First, all geographical zones have experienced an increase in the mean years of schooling. Over the period 2004 to 2010, an average of 6 months were added to the regions' years of schooling; the highest being the Northern zone (1.12 years) and the lowest being the Lake zone (0.19 years) (Figure 2). Second, the southern Highland zone which had the third lowest mean years of education in 2004, had emerged by 2010 among the top three zones with highest mean years of education. The zone added a year to its mean years of schooling. As the indices applied in this study use population weights, the population factor played a part as well, as it is the zone (southern Highlands) with a relatively large population size of 5.8 million persons (fourth most populous zone).

The geographical zones which had the lowest mean years of schooling (Central and Western) in 2004 managed to raise their levels of education attainment at a much higher rate (7 and 11 per cent respectively) than the Southern and Lake zones. The latter two had higher education attainment levels than the Central and Western zones in 2004 and their mean years of schooling increased at a relatively lower rate of 5 and 4 per cent respectively. Reduction in regional inequality in education attainment has a historical post-independence perspective as well. Cooksey et al. (1994) consider that the nationalization of all private schools after independence eliminated the tendency for some of the private schools to favour particular regions, religious, or racial communities. Such measures in turn are considered to have countered ethnic differences in education attainment as some schools used to cater for the more well-to-do ethnic segments of Tanzanian society (Lofchie 2013).

Figure 2: Added years of schooling between 2004 and 2010



Source: Author's illustration based on United Republic of Tanzania (2004 and 2010).

Pre-independence history plays a role in explaining sub-national inequalities as well. The Northern zone, which is made up of regions such as Arusha, Kilimanjaro, and Manyara, was the place of residence of Christian missionaries who invested in modern education institutions (primary and secondary schools) parallel to their objective of spreading Christianity (Mesaki 2011). In contrast, geographical areas such as Zanzibar (DHS 2004, 2007, and 2010) were settled by Arab settlers who established few equivalents to the mission schools (Lodhi and Westerlund 1997). It is therefore not surprising that the mean years of education for the Northern region in the earlier DHS (1991 and 1999) is higher than that of the Coastal zone which Zanzibar was part of. In fact the mean years of education for Northern regions is higher than the rest of the remaining zones for the first and second DHS.

## 5.2 Wealth inequality

Wealth inequality is assessed at four levels: (i) between geographical zones; (ii) between male and female heads of households; (iii) between rural and urban areas; and (iv) between the business city of Dar es Salaam and other sub-national regions. Two messages can be taken from Table 4. First, Tanzanian society is becoming more unequal with all three indices showing rising wealth inequality between zones, gender, and also between rural and urban areas. The Gcov index, for instance, demonstrates the major increase in inequalities. The Gcov for geographical zones has increased from 0.407 in 2004 to 0.478 in 2010 and from 0.058 to 0.094 in the case of gender over the same period of time. This implies that, sub-national regions in Tanzania, male and female heads of households, and rural and urban areas are disproportionately benefiting from the impressive economic growth rates that Tanzania has experienced over the past decade.

The second message from Table 4 is that despite increasing wealth inequalities in the other aspects, the disparities between the business city of Dar es Salaam and other sub-national regions is declining over time. This particular trend is consistently demonstrated by all three measures of inequality. Specifically, the Gcov which compares the mean values of each group to the national mean declined from 0.619 to 0.581 between 2004 and 2010, and the Ggini, which compares every group with every other group, declined from 0.056 to 0.053 over the same period of time.

In short, that implies, other regions are catching up with the business capital of Tanzania in terms of wealth accumulation.

Table 4: Aggregate measures of horizontal inequality in wealth

	Years	Region/ zone	Gender	Rural/ urban	Capital/ others
Gcov	2004	0.40723	0.05802	0.46939	0.61979
	2007	0.46997	0.05497	0.47091	0.61796
	2010	0.47766	0.09437	0.49304	0.58110
	Δ	+	+	+	-
Ggini	2004	0.07120	0.01822	0.12091	0.05608
	2007	0.08877	0.01723	0.12067	0.05656
	2010	0.08306	0.02961	0.12784	0.05326
	Δ	+	+	+	-
Gtheil	2004	0.01058	0.00048	0.03325	0.01062
	2007	0.01317	0.00043	0.03254	0.011
	2010	0.014	0.00126	0.03832	0.00927
	Δ	+	+	+	-

Note: Δ is change from 2004 to 2010. Data are graphed in Figures A1–A5 in the Appendix.

Source: Author's calculations.

Asset ownership is a common indicator of individuals' and households' socio-economic status. Table 5 shows that Tanzania society has experienced a declining trend in inequality in five out of the six assets. The declining trend in ownership of assets such as television sets and radio implies a decline in the deprivation of information. An interesting trend is the rise in the inequality of ownership of cars, an asset that has higher monetary value than the other assets which are characterized by declining inequality. One important interpretation is that all sub-national levels have gained from the recent economic growth, but richer sub-national areas have captured a large share of the overall national income gains.

Table 5: Trends in Gcov statistic for each individual assets

	2004	2010
Radio	0.13	0.08
Television	0.64	0.39
Refrigerator	0.72	0.49
Bicycle	0.26	0.26
Motorcycle	0.72	0.44
Car	0.56	0.60

Source: Author's calculations.

## 6 Conclusion

The goal of this study was to advance our understanding of trends in sub-national inequalities in educational attainment and wealth in Tanzania. In recent years, inequality in education attainment has been declining after a rising trend during the 1990s. Education reforms which were carried out in the mid-1990s (e.g. liberalization of the education sector) and early 2000s (abolition of primary school fees) have significantly enhanced enrolment rates (Hoogeveen and Rossi 2013) and possibly contributed to the observed recent declining sub-national inequalities in

education attainment. We observe consistent decline in gender, rural–urban, and Dar es Salaam–other regions inequalities in education attainment.

To further reduce sub-national inequality in educational attainment, the government needs to review the formula-based fiscal allocation system to strengthen transparency and abide with the established indicators being used to determine resource transfers at the sub-national level. Reference is made to variables such as population, land area, and number of poor residents in each receiving area. The variables should be statistically sound and be regularly updated, sourced from independent sources that are respected by all stakeholders, and data that are drawn from sources that are not able to be manipulated should be used (World Bank 2003). Such principles will potentially position the formula-based fiscal transfers system to be one of the means for addressing resource disparities and ultimately contribute to reducing sub-national inequalities in socio-economic outcomes. Some reviews of the formula-based fiscal transfers system have revealed inconsistencies in adherence to established formulas (see for instance, SIKIKA 2012).

The main finding from assessing wealth inequality shows that Tanzanian society is increasingly becoming unequal in wealth as evidenced by an upward trend in different inequality measures. A number of policy actions could be pursued. They include enhanced better-targeted subsidies, improved business environment, and economic opportunities for poor sub-national areas and regions, including labour policies that promote hiring which could potentially reduce sub-national differences in wealth. Improving the business environment needs to be a policy priority as the country is ranked 121st out of a sample of 143 economies in the 2014 World Economic Forum's (WEF) global competitive index. One of the serious concerns is the staggering regional disparities in access to energy. For example, the region of Dar es Salaam consumes 47 per cent of the entire national electricity consumption compared to regions such as Mtwara, Singida, Ruvuma, Manyara, Kigoma, Rukwa, and Lindi which each consume less than 1 per cent (Davids and Maliti 2015). Weak energy infrastructures are of significant magnitude as producers are losing 15.1 per cent of their sales due to electricity outages (World Bank 2016). It is almost impossible to make Tanzanian society economically equal in the presence of such levels of sub-national disparities in business and investment climate. This study has only focused on between-region inequality. It is a starting point for future comprehensive studies of wealth inequality that could examine whether similar or even opposite trends are emerging at the district level.

## References

- Alesina, A., A. Devleeschauwer, W. Easterly, S. Kurlat, and R. Wacziarg (2003). 'Fractionalization'. *Journal of Economic Growth*, 8(2): 155–94.
- Arndt, C., L. Demery, A. McKay, and F. Tarp (2016). 'Growth and Poverty Reduction in Tanzania'. In C. Arndt, A. McKay, and F. Tarp (eds), *Growth and Poverty in Sub-Saharan Africa*. Oxford: Oxford University Press.
- Berg, A., and J. Ostry (2011). 'Inequality and Unsustainable Growth: Two Sides of the Same Coin?'. IMF Staff Discussion Note. Washington, DC: International Monetary Fund.
- Birdsall, N., and J.-L. Londofio (1997). 'Asset Inequality Matters: An Assessment of the World Bank's Approach to Poverty Reduction'. AEA Papers and Proceedings, 87/2:32-37. Washington, DC: The World Bank.
- Bratton, M., R. Bhavnani, and T. Chen (2012). 'Voting Intentions in Africa: Ethnic, Economic or Partisan?'. *Commonwealth & Comparative Politics*, 50(1): 27–52.

- Bush, K.D., and D. Saltarelli (eds) (2000). *The Two Faces of Education in Ethnic Conflict: Towards a Peacebuilding Education for Children*. Florence: United Nations Children's Fund, Innocenti Research Centre.
- Cooksey, B., D. Court, and B. Makau (1994). 'Education for Self-Reliance'. In J.D. Barkan (ed.), *Beyond Capitalism vs. Socialism in Kenya & Tanzania*. Boulder & London: Lynne Rienner Publishers.
- Davids, C., and E. Maliti (2015). *Situational Analysis in Support of UNDAF II*. Dar es Salaam: UNDP.
- Deininger, K., and P. Olinto (2000). 'Asset Distribution, Inequality, and Growth'. World Bank Policy Research Working Paper 2375. Washington, DC: World Bank.
- Deininger, K., and L. Squire (1998). 'New Ways of Looking at Old Issues: Inequality and Growth'. *Journal of Development Economics*, 57(2): 259–87.
- Demombynes, G., and H. Hoogeveen (2007). 'Growth, Inequality and Simulated Poverty Paths for Tanzania, 1992–2002'. *Journal of African Economies*, 16(4): 596–628.
- Elbers, C., O.J. Lanjouw, and P. Lanjouw (2003). 'Micro-level Estimation of Poverty and Inequality'. *Econometrica*, 71: 355–64.
- Gisselquist, R. (2015). 'Group-based Inequalities: Patterns and Trends Within and Across Countries'. Project Overview Note. Helsinki: UNU-WIDER.
- Gurr, T.R. (1970). *Why Men Rebel*. Princeton: Princeton University Press.
- Hassine, N.B., and A. Zeufack (2015). 'Inequality of Outcomes and Inequality of Opportunity in Tanzania'. World Bank Policy Research Working Paper 7260. Washington, DC: World Bank.
- Hoogeveen, J., and M. Rossi (2013). 'Enrolment and Grade Attainment Following the Introduction of Free Primary Education in Tanzania'. *Journal of African Economies*, 22(3): 375–93.
- Jackson, P. (2015). *Handbook of International Security and Development*. Cheltenham, UK: Edward Elgar Publishing.
- Lam, D., M. Leibbrandt, and A. Finn (2015). 'Schooling Inequality, Returns to Schooling, and Earnings Inequality: Evidence from Brazil and South Africa'. 10th IZA/World Bank Conference on Employment and Development Bonn, Germany 5–6 June 2015.
- Lipsky M. (1968). 'Protest as a Political Resource'. *American Political Science Review*, 62(4):1144–58.
- Lodhi, A.Y., and D. Westerlund (1997). 'African Islam in Tanzania'. Islam Tanzania Website. Available at: <http://www.islamtanzania.org/articles/islam2.htm> (accessed on 23 September 2016).
- Lofchie, M. (2013). 'The Roots of Civic Peace in Tanzania'. In W. Ascher and N. Mirovitskaya (eds), *The Economic Roots of Conflict and Cooperation in Africa*. New York: Palgrave Macmillan.
- Malipula, M. (2014). 'Depoliticised Ethnicity in Tanzania. A Structural and Historical Perspective'. *Afrika Focus*, 27(2): 49–70.
- Mesaki, S. (2011). 'Religion and the State in Tanzania'. *Cross-Cultural Communication*, 7(2): 249–59.
- Miguel, E. (2004). 'Tribe or Nation? Nation Building and Public Goods in Kenya versus Tanzania'. *World Politics*, 56: 327–62.
- Mkenda, A., E. Luvanda, L. Rutasitara, and A. Naho (2004). *Poverty in Tanzania: Comparisons across Administrative Regions*. Dar es Salaam: University of Dar es Salaam.

- Nel, P. (2006). 'The Return of Inequality'. *Third World Quarterly*, 27(4): 689–706.
- Nissanke, M., and E. Thorbecke (2006). 'Channels and Policy Debate in the Globalization–Inequality–Poverty Nexus'. *World Development*, 34(8): 1338–60.
- Perotti, R. (1996). 'Growth, Income Distribution and Democracy: What the Data Say'. *Journal of Economic Growth*, 1(2): 149–87.
- Persson, T., and G. Tabellini (1994). 'Is Inequality Harmful for Growth?'. *American Economic Review*, 84(3): 600–21.
- Ravallion, M. (1997). 'Can High-inequality Developing Countries Escape Absolute Poverty?'. *Economic Letters*, 56(1): 51–57.
- Ravallion, M. (2005). 'Inequality is Bad for the Poor'. World Bank Policy Research Working Paper 3677. Washington, DC: World Bank.
- SIKIKI (2012). *Tanzanian Health Sector Budget Analysis*. Dar es Salaam: SIKIKI.
- Smits, J., and R. Steendijk (2015). 'The International Wealth Index (IWI)'. *Social Indicators Research*, 122(1): 65–85.
- Stewart, F. (2000). 'Crisis Prevention: Tackling Horizontal Inequalities'. *Oxford Development Studies*, 32(3): 245–262.
- Stewart, F., G. Brown, and L. Mancini (2010). 'Monitoring and Measuring Horizontal Inequalities'. CRISE Overview No. 4. Oxford: Centre for Research on Inequality, Human Security and Ethnicity.
- Thorbecke, E., and C. Charumilind (2002). 'Economic Inequality and its Socioeconomic Impact'. *World Development*, 30(9): 1477–95.
- UNICEF (2015). *Does Horizontal Education Inequality Lead to Violent Conflict? A Global Analysis*. New York: UNICEF.
- United Republic of Tanzania (1991). *Tanzania Demographic and Health Survey 1991*. Dar es Salaam: National Bureau of Statistics.
- United Republic of Tanzania (1999). *Tanzania Demographic and Health Survey 1999*. Dar es Salaam: National Bureau of Statistics.
- United Republic of Tanzania (2004). *Tanzania Demographic and Health Survey 2004*. Dar es Salaam: National Bureau of Statistics.
- United Republic of Tanzania (2005). *Poverty and Human Development Report 2005*. Dar es Salaam: Ministry of Planning, Economy and Empowerment.
- United Republic of Tanzania (2007). *Tanzania Demographic and Health Survey 2007*. Dar es Salaam: National Bureau of Statistics.
- United Republic of Tanzania (2010). *Tanzania Demographic and Health Survey 2010*. Dar es Salaam: National Bureau of Statistics.
- United Republic of Tanzania (2012). *Household Budget Survey*. Dar es Salaam: Ministry of Finance and Planning.
- United Republic of Tanzania (2013). *Pre-Primary, Primary and Secondary Education Statistics in Brief 2013*. Dar es Salaam: Prime Minister's Office Regional Administration and Local Government.
- World Bank (2003). 'Revenue Analysis: Inter-Governmental Fiscal Relations and Local Revenue in Tanzania'. A Paper Prepared for the Training Workshop on Budget Analysis and



Tanzania's Participatory Public Expenditure Review Organized by REPOA on 20–23 January 2004. Available at: [http://info.worldbank.org/etools/docs/library/103081/case2003\\_tanzania\\_budget.pdf](http://info.worldbank.org/etools/docs/library/103081/case2003_tanzania_budget.pdf) (accessed on 25 May 2016).

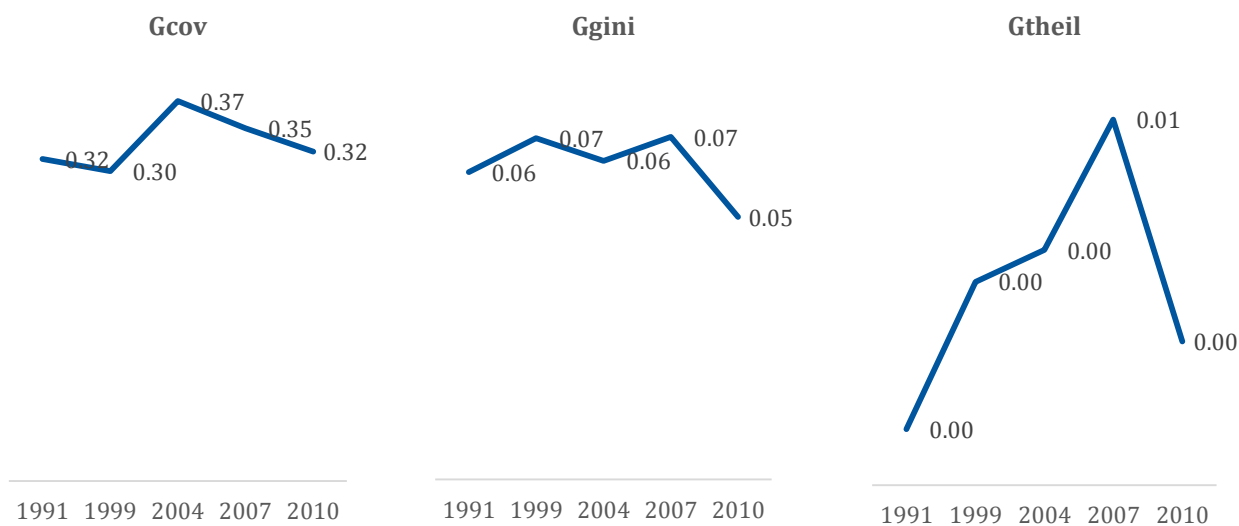
World Bank (2015). *Tanzania Mainland Poverty Assessment*. Washington, DC: World Bank.

World Bank (2016). 'World Development Indicators 2016'. Washington, DC: World Bank. Available at: [http://info.worldbank.org/etools/docs/library/103081/case2003\\_tanzania\\_budget.pdf](http://info.worldbank.org/etools/docs/library/103081/case2003_tanzania_budget.pdf) (accessed on 25 August 2016).

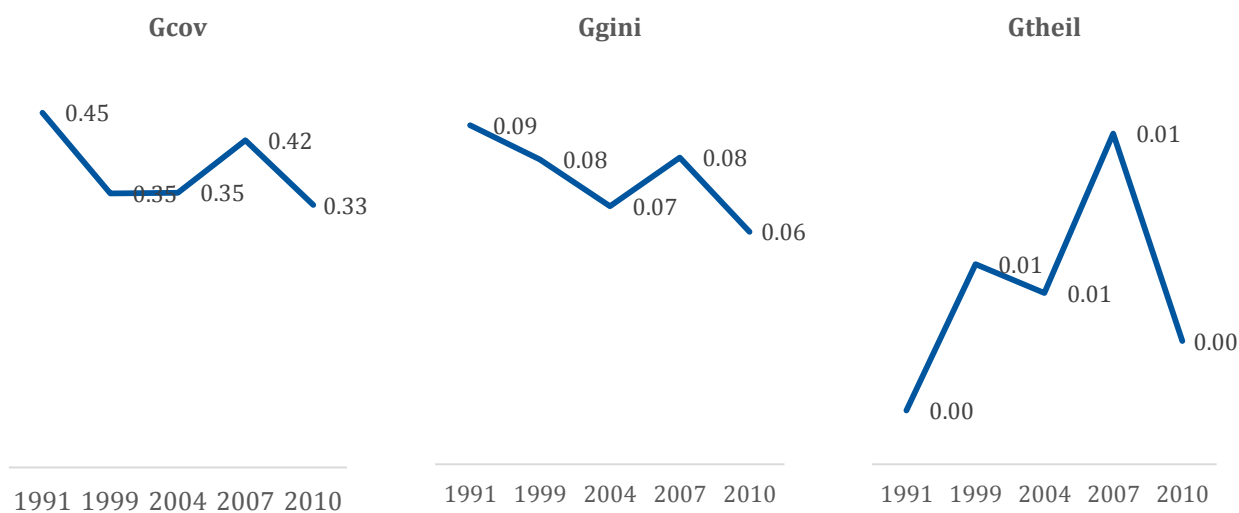
## Appendix: Graphical trends in horizontal inequality

Figure A1: Inequality indices—education attainment

### 15+ years



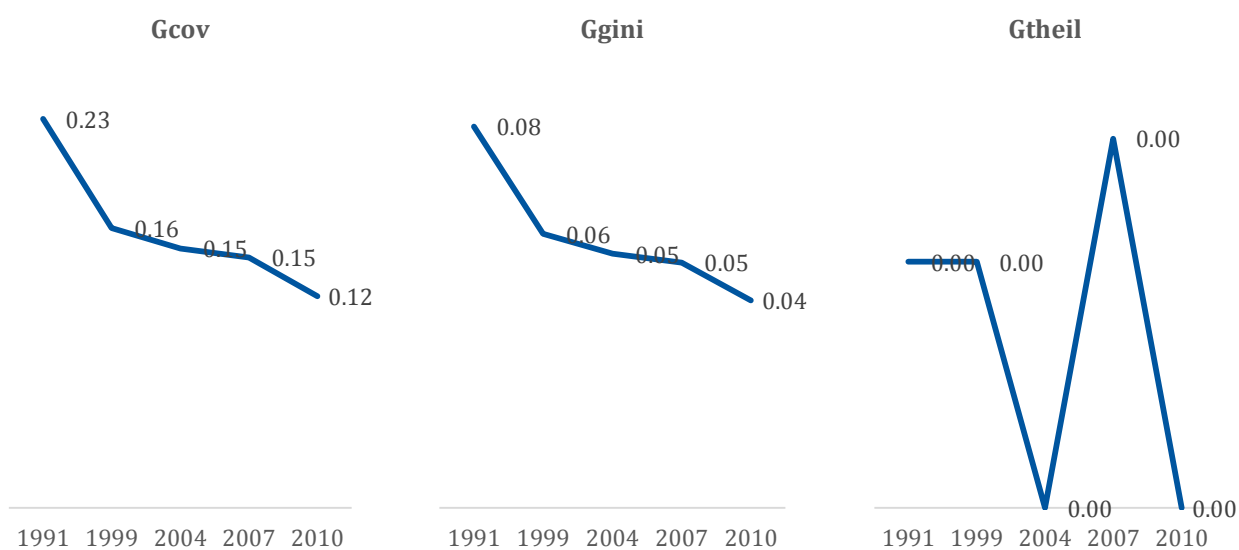
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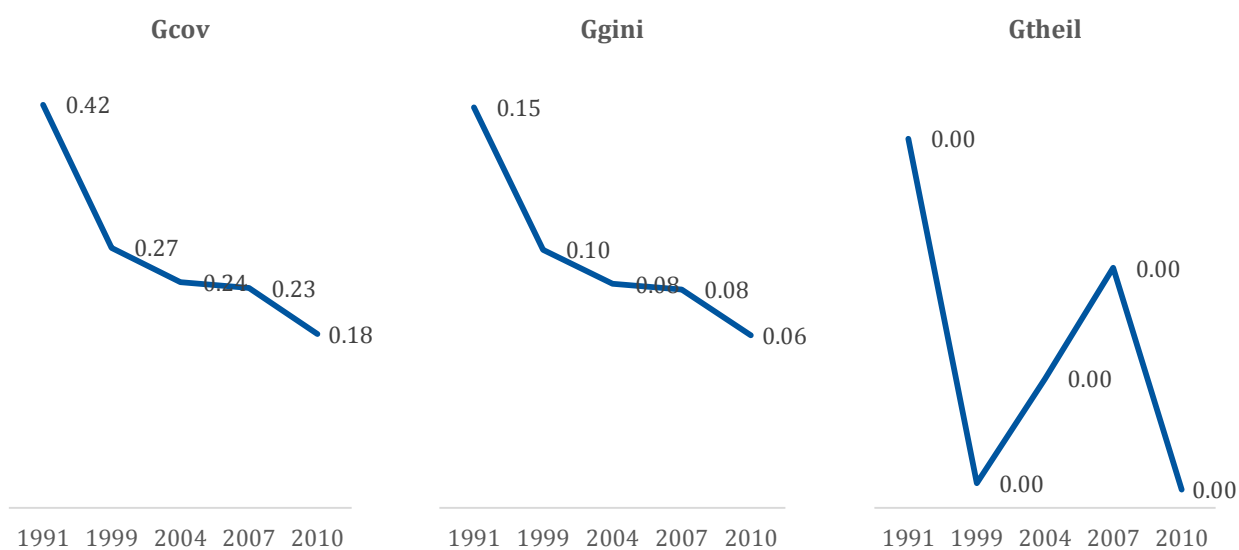
Source: Author's illustration based on United Republic of Tanzania (1991, 1999, 2004, 2007, and 2010).

Figure A2: Education inequality—gender disaggregation (education attainment)

### 15+ years



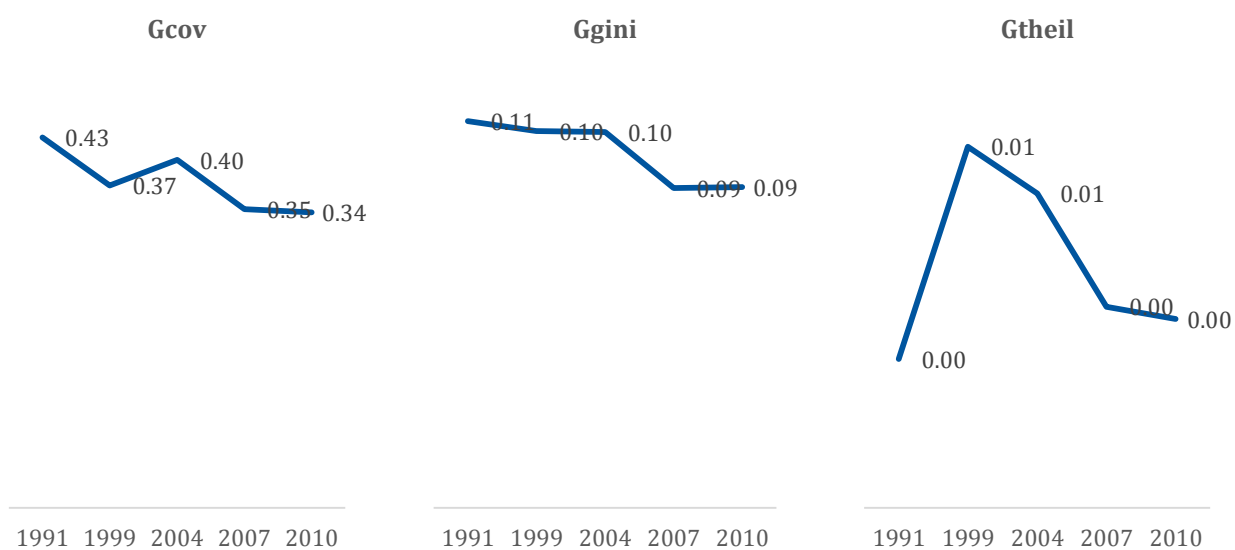
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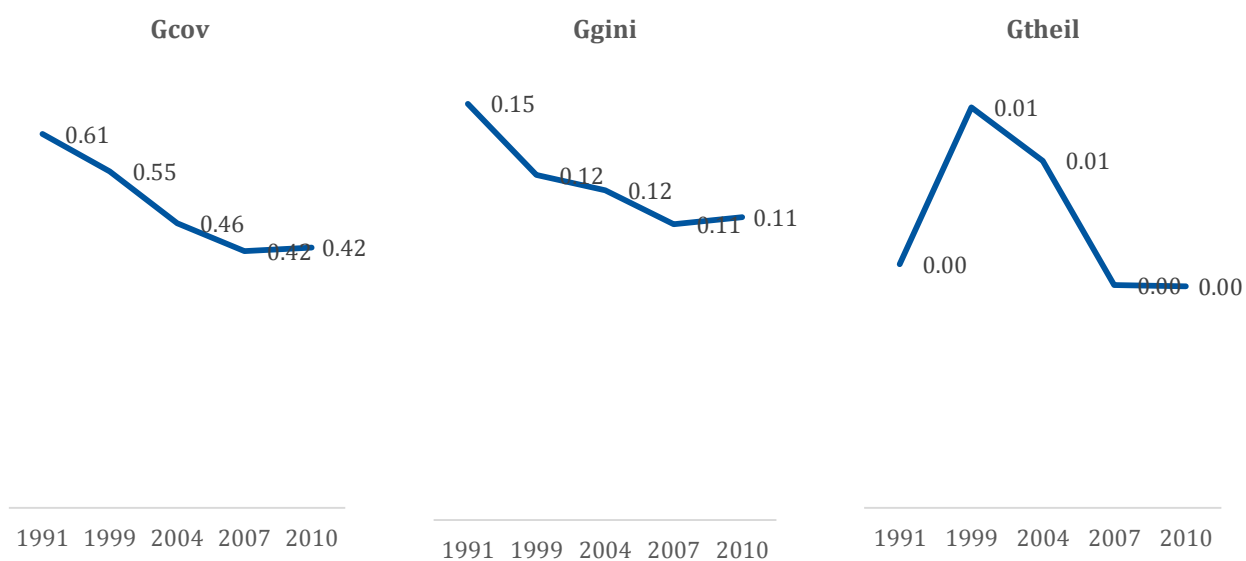
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Figure A3: Inequality indices—education attainment (urban–rural areas)

### 15+ years



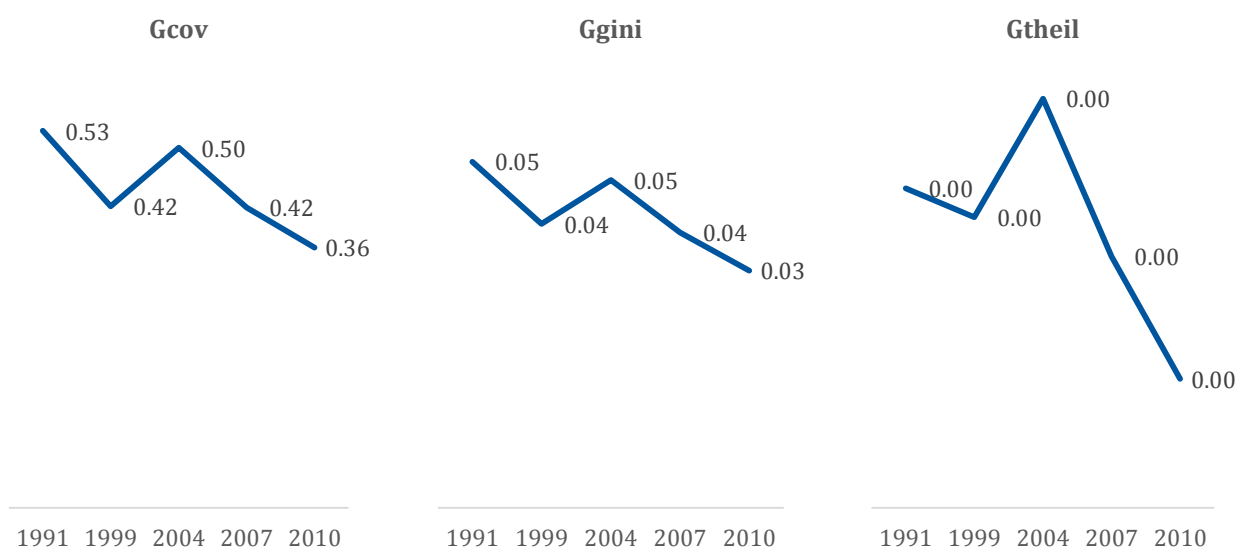
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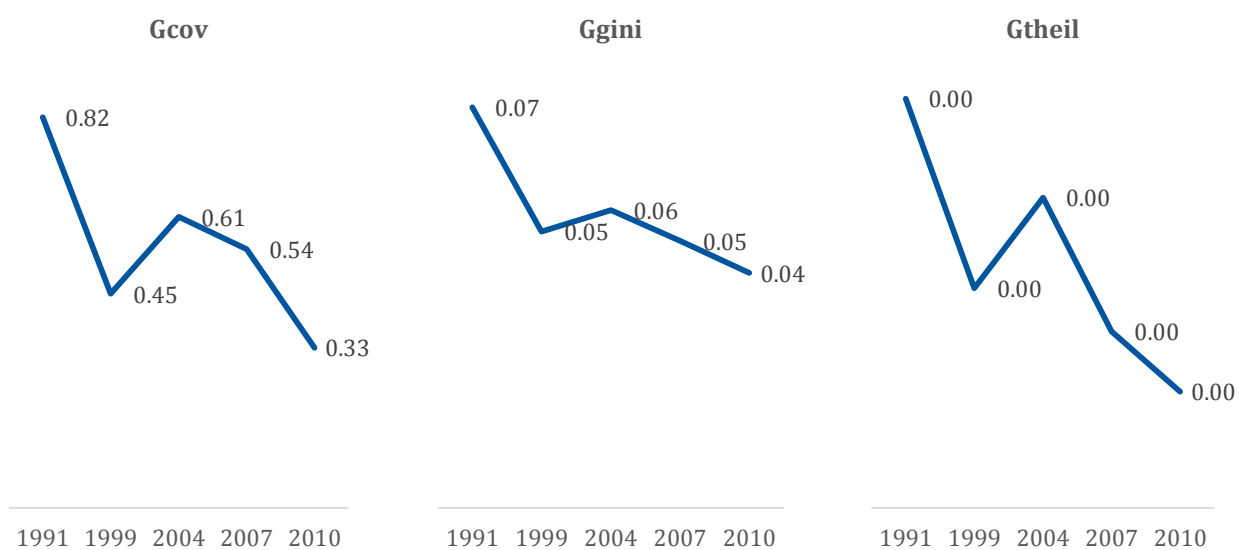
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Figure A4: Inequality indices—education attainment (capital–other regions)

### 15+ years



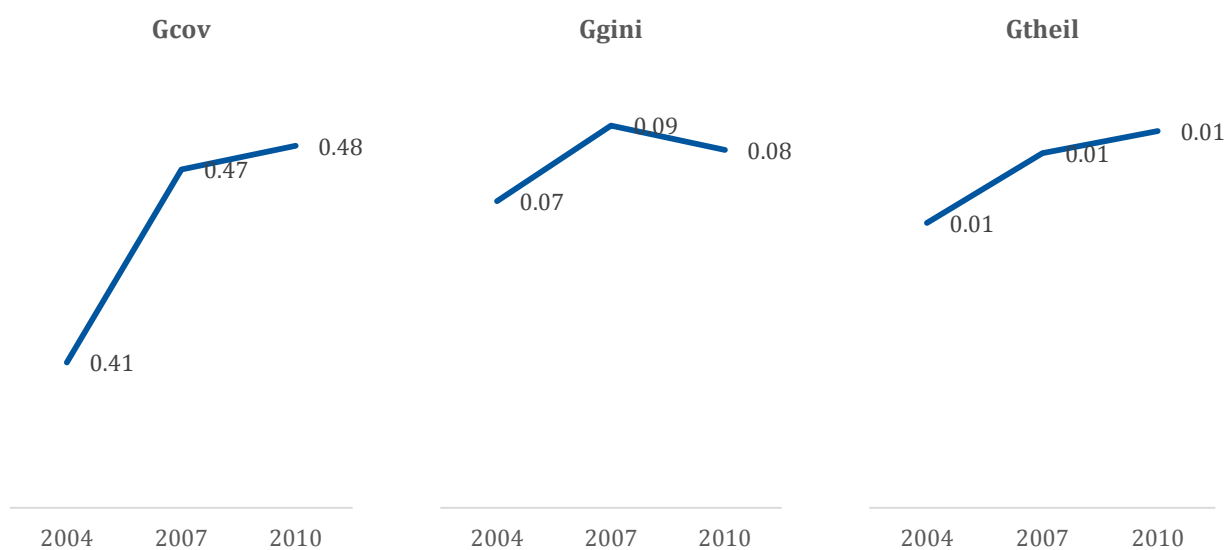
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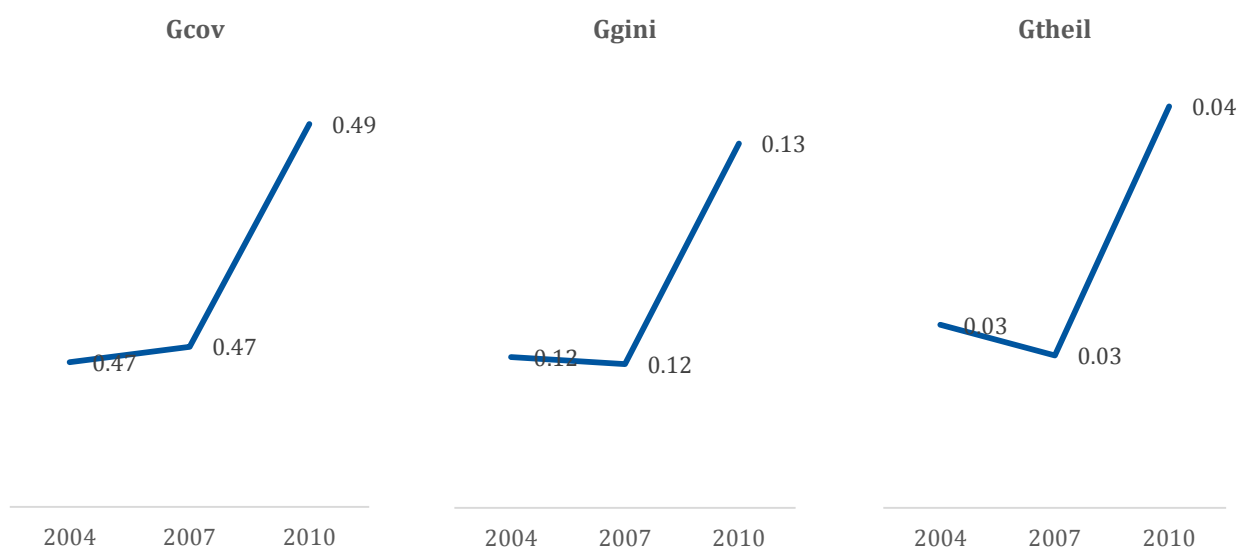
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Figure A5: Wealth inequality

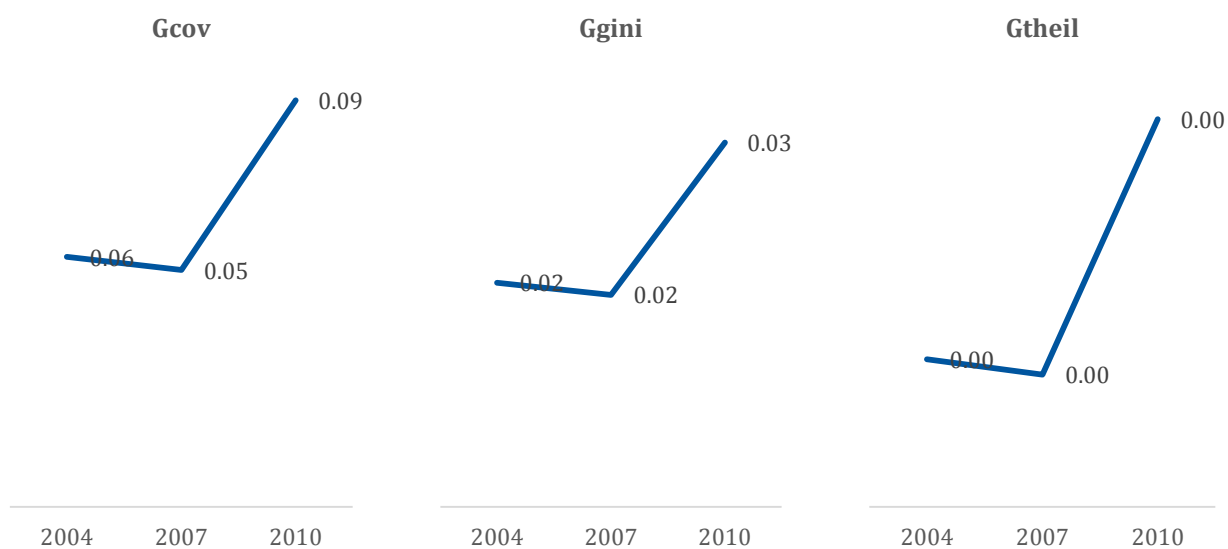
**Regions/zones**



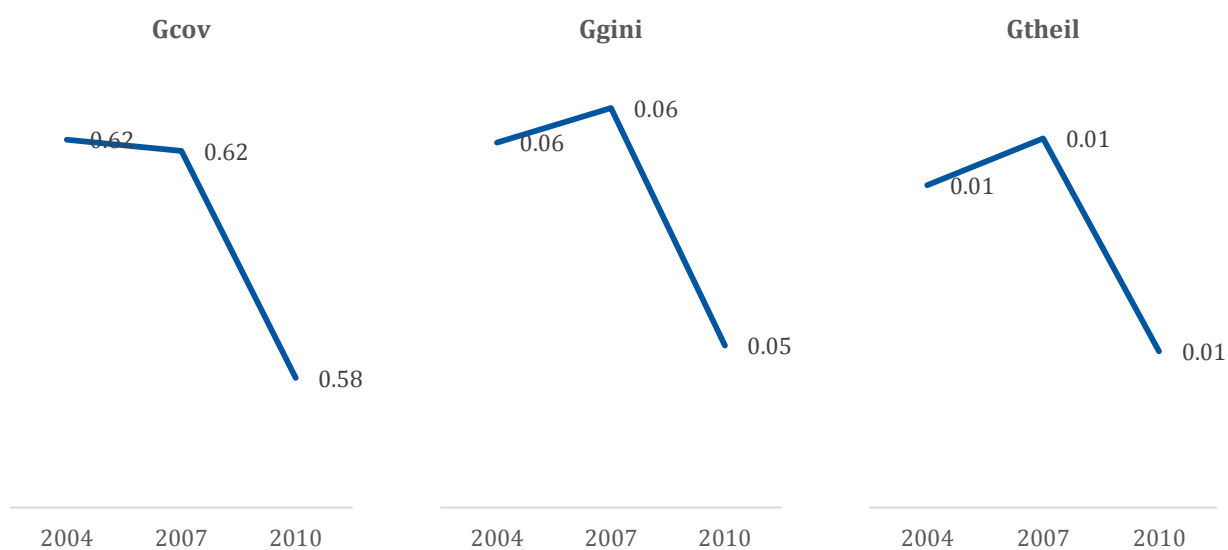
**Rural-Urban**



## Gender



## Capital-other regions



Source: Author's illustration based on United Republic of Tanzania (1991, 1999, 2004, 2007, and 2010).