UNIVERSITÀ DEGLI STUDI
DI PERUGIA

ISSN 2385-2275

Working papers of the
Department of Economics
University of Perugia (IT)

The nexus of structural transformation, employment and education: Evidence from Mozambique and Tanzania

Anita V. Stanevaa

Theo Sparreboomb

Hany Abdel-Latifc

Working paper No. 12

June 2015

The nexus of structural transformation, employment and education: Evidence from Mozambique and Tanzania

Anita V.Staneva[a], Theo Sparreboom[b], Hany Abdel-Latif[c]

[a]*AUT, New Zealand*
[b]*International Labour Office, Geneva*
[c]*Swansea University, UK*

Abstract

Africa's recent economic performance has been quite impressive. However, strong economic growth has not always corresponded to sufficient poverty reduction, partly because it has failed to generate productive employment. This paper compares the experiences of two fast growing African countries and provides an in depth insight on the different growth paths being pursued. In particular, the study aims to examine the role of education in facilitating structural changes in Mozambique and Tanzania. Building from micro-level estimates, we find that major structural change in the employment and economic structure in Tanzania and Mozambique was only to a limited extent translated into higher productivity add and decent work creation.

Keywords: Structural transformation, returns to education, labour reallocation

JEL codes: I2, J6, N3

1. Introduction

Structural changes contribute to economic development by enhancing productivity and creating more and better jobs, which is demonstrated by a wide and growing body of literature. Structural changes into higher value added sectors and upgrading of technologies in existing sectors by applying more complex production technologies, increase demand for higher levels of education and skills. Education and skills are intrinsically linked to these processes and constitute a major driver of economic transformation. An adequately educated labour force is essential for a strong economic growth. It is also valued for its role in helping people to become more productive, create capacity to innovate and adopt new technologies. Education and skills training themselves, however, do not create (decent) jobs, and an increase in education attainment levels may also result in unemployment, over-qualification and the underutilization of skills (Sparreboom and Abdullaev, 2013).

To place this idea into context, the current paper compares the experiences of two African

economies - Mozambique and Tanzania. The two countries have been selected on the basis that they were predicted to be one of the fastest growing African economies during 2011-2015 and had a strong past performance[1]. However, employment challenges in these two countries are multidimensional, and range from high unemployment rates to diverse forms of under-employment and expanding informal economy to the lack of skilled labour to respond to employer's needs. While the structure of their economies has undergone some changes in the last decade, the slow progress in poverty reduction indicates that Tanzania and Mozambique are in a progress of transformation (African Economic Outlook, 2013). Mozambique remains one of the poorest countries in the world with the lowest Human Development Index (HDI value for 2012 is 0.327, positioning the country at 185 out of 187 countries). The country ranks 21st out of 28 Sub-Saharan African countries on the Education for All Development Index, and have one of the world highest illiteracy rates (UNESCO, 2012). Tanzania's HDI is 0.476, which gives the country a rank of 152 out of 187 countries with comparable data. Both economies are still highly dependent on agriculture, contributing an estimated 30 percent to the GDP and employing nearly 80 percent of their working population.

In the light of the above, the present paper complements the existing literature by undertaking a comparative study and investigating the link between economic structural transformation and employment on the one hand, and returns to skills in the labour market on the other. Although many factors contribute to labour reallocation, the current paper uses detailed micro-level data to quantify the role of one particular driving force - increased educational attainment. The paper moves the related literate forward in a bid to improve our understanding of the role of education in facilitating structural changes. Our interest in increased educational attainment stems from the rapid expansion of the education systems in Tanzania and Mozambique during the 2000s and increasing share of the population with education level above lower primary education. According to UNESCO's education sector analysis, government spending on education in Tanzania has risen above the average for countries with a similar level of development. In Mozambique, between 1994 and 2012, gross enrolment rate increased from 62% to 110% at the lower primary level and from 15% to 34% at the lower secondary level (UNESCO). Thus, we empirically examine the role of education in facilitating structural transformations and aim at better understanding how different patterns of economic development in these two economies are related to productivity and the quality of jobs

[1] An analysis by IMF (2012) finds that over the ten years to 2010, no fewer than six of the word's ten fastest-growing economies were in sub-Saharan Africa. See also The Economist (2011). Source: IMF World Economic Outlook, 2012

created.

First, we expect, the productivity growth in the two countries differs between sectors and sectoral source of productivity growth have varied over time. To examine this, the labour productivity component of the growth is decomposed into sector specific 'within effect' and 'between effect'. The last effect reflects structural changes (ADB, 2013). The decomposition considers that an increase in the labour productivity can result from either productivity improvements within the sector or from reallocation of jobs across sectors, i.e. from low-to high-productivity sectors (ILO, 2013a). We further measure education's impact on growth through enabling labour reallocation between sectors. Specifically, the education's effect on aggregate growth is decomposed into a component, which measures increasing human capital, and a between sector component - reallocating workers from agriculture to non-agriculture. Second, we consider the change in education intensity of employed workers in the economy or within a sector as indication of a change in the nature of jobs. An increase in education intensity within sectors suggests the creation of 'good' jobs. Within this framework, the change in education intensity is decomposed into reallocation effect, which is due to structural change and the shift of educated workers between sectors, and the 'within sector effect', which measures the change in educational intensity within a particular sector. Third, we investigate the importance of education through modelling sectoral employment decision and capturing the differential time effect on non-agricultural employment through the recent expansion of education in both countries. In particular, our contribution is related to the question of whether increased in the supply of workers with completed secondary or tertiary education affect labour reallocation. Finally, to assess the importance of this channel, we estimate education contribution through measuring human capital return. For developing countries, such as Mozambique and Tanzania, evidence is very limited as to what the earnings function looks like and how the returns to education, which is assumed to be an indication of labour productivity, changed over time.

The rest of the paper is organised as follows: Section 2 outlines the main channels through which education affects economic growth; Section 3 briefly overviews the education and structural transformation in the two countries; Section 4 discusses the data and the methodology applied; Section 5 provides a comparative analysis of the estimates and the final section concludes.

2. Channels through which education affect economic transformation

Economic and structural transformation is a dynamic process and is viewed through several lenses:

a declining share of agriculture in GDP and employment; a transformation from rural to urban, underpinned by rural and urban development; the rise of a modern industrial and service economy; and a demographic transition from high rates of births and deaths to low rates of births and deaths (associated with better health standards). It is also associated with rising agricultural productivity, an integrated economy and rising per capita growth rates (Timmer and Selvin, 2008). Economic transformation is highly correlated and linked with the economic growth through improvement of productivity in the agriculture and other sectors of the economy. Accordingly, the drivers found in the literature for economic transformation are the drivers of economic growth and the determinants of agricultural productivity. Those mentioned most repeatedly are the utilization of improved technologies; investment in higher educational and skills levels for the labour force; lower transactions costs to connect and integrate economic activities, and more efficient allocation of resources (Clark, 2006; UNECA 2011).

Education constitutes a major driver of economic transformation and the literature have been extensively measured its contribution to economic growth (Schultz, 1961; Denison, 1962; Barro, 1991). The theory considers several mechanisms through which education may affect economic development. Firstly, at a micro-level, we would expect education to increase human capital inherent in the labour force, which would increase labour productivity and subsequently the economic growth, so there is interaction between human capital and labour productivity (Bils and Klenow 2000; Hanushek and Kimko 2000). This pathway grows from the rate of return literature in labour economics. The idea is that a worker is paid a wage equal to his marginal revenue product of labour; hence educated workers would have a higher marginal revenue product of labour as they are more productive. Secondly, education, which is closely linked to new technologies, may increase the innovative capacity of the economy (as in theories of endogenous growth, e.g., Romer, 1990). Education may facilitate transmission of necessary knowledge to implement successfully new technologies, which again promotes the economic growth (Benhabib, 2005). The third link is between human capital and labour market participation, where investment in human capital may increase the probability of finding jobs and entering the labour market (Glewwe 2002). An increase in the amount of the labour input will increase the output of economically active and hence the economic growth. The fourth link relates to the interaction of human capital with domestic and foreign investment (Oketch 2006). It can be argued that more skill labour force is better able to make effective use of the capital stock due to domestic and foreign investments. This interaction with physical capital may have a potentially powerful effect on the rate of growth of the economy.

Our paper is related to several recent studies that emphasize the role of increasing human capital or skill-intensity behind labour reallocation in developing economies. For example, McMillan and Rodrick (2011) show a shift of workers from sectors with below-average productivity into sectors with above-average productivity for a few Asian countries, but find the opposite pattern for countries in Latin America and sub-Saharan Africa, a phenomenon they name 'productivity-reducing structural change'. Building from micro-level estimates, Lee and Malin (2013) explore education's role in improving labour allocation between agricultural and non-agricultural sectors in China. They find that education's impact on labour reallocation between sectors accounts for about 9 percent of Chinese growth, whereas its impact on within-sector human capital growth explains only 2 percent. Lee and Malin (2013) conclude that, when frictions cause large productivity gaps across sectors and returns to education are greater in the higher-productivity sectors, education policy may be a useful tool for increasing efficiency.

3. Overview of education and structural transformation in Mozambique and Tanzania

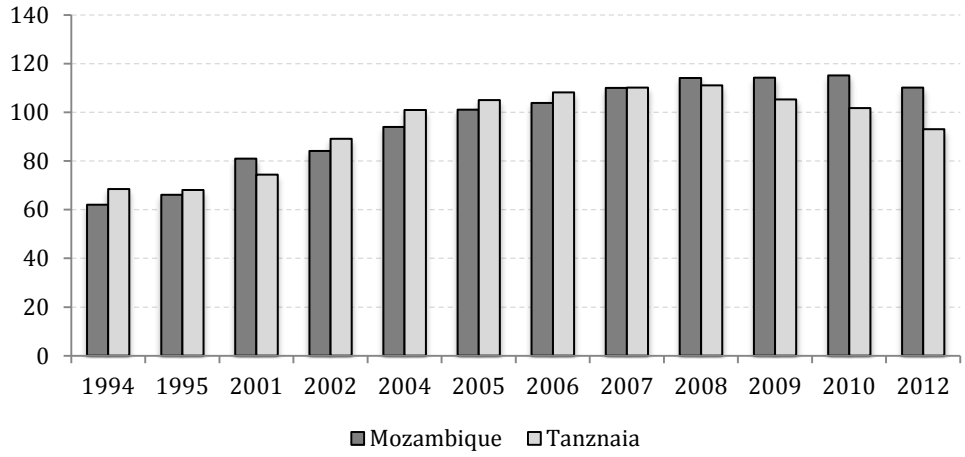
3.1. Education

In both countries, the strategies for growth and reduction of poverty reflect the strong commitment to development of the education sector and include targets, such a raising primary enrolment as well as transition rate from primary to secondary school. Since independence of Mozambique in 1975, the country has faced series of education challenges and has made significant contributions in education. In order to adapt the education system to the new developments, a new National Education System was introduced in 1982, with a strong focus on schooling expansion, new structure, new curricula, and new textbooks. The change not only emphasized the constitutional right to education, but it also introduced compulsory and universal schooling of seven years, public access to professional, technical and teachers' pedagogical training (Simone, 2009). In 2004-2005, an important set of reforms were enacted aiming to increase access to education and raising completion rates. Components of the reform were closely related to a reduction in direct costs for households by abolishing national tuition and other fees in primary education and providing free textbooks; increased funding at school levels; introduction of a new curriculum, organized into three main blocks – grades 1-2, grades 3-5 and grades 6-7 (Fox et al., 2012). Tanzania has a long history of trying to reduce illiteracy as well. The latest major effort in this area started in 2002 with the implementation of the Primary Education Development Program, which aimed to deliver

sustainable, basic education of good quality to all by making education affordable by abolishing school fees and all other mandatory parental contributions. It was envisaged that by offering free education all parents (rich and poor) would send their children to school in time (i.e. at the age of 7). The emphasis on primary education in both countries is visible in the distribution of primary enrolment rates. The relevant reforms and in particular abolition of fees have resulted in remarkable increase in the primary enrolment rates. Between 1994 and 2012, gross enrolment rate in Mozambique increased from 62% to 110% at the lower primary level as shown in Figure 1. Similarly, the enrolment in primary education in Tanzania increased from 68% in 1994 to 102% in 2010. Enrolments in secondary education also increased rapidly and the gross enrolment rate reached 26% in Mozambique and 35% in Tanzania in 2012 (WDI).

The rapid expansion of the education systems, in both Tanzania and Mozambique, increased the share of the population with education level above primary, which reflected in the education profile of the labour force and possible in relation to structural changes in the economies by rising value added. We expect higher levels of education would determine productivity increase by enhancing efficiency in use of existing technologies and by facilitating structural transformation from low to higher value added sectors.

Figure 1: Evolution of gross enrolment rate in primary education (%) in Mozambique and Tanzania



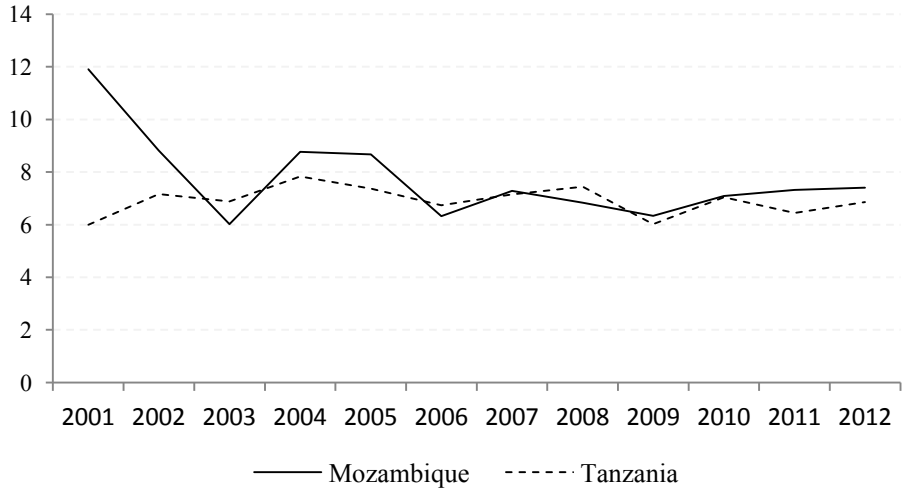
Source: World Development Indicator (WDI).

3.2. Economic development

In many respects, Mozambique and Tanzania seem similar. Both economies depend largely on agriculture, which accounts for more than one-quarter of the GDP. The two economies have been making significant progress in terms of socio-economic development under the combined impact of

macroeconomic stability and faster economic growth. Figure 2, which compares the annual GDP growth rate between 2001 and 2012, shows that Mozambique has weathered the global economic and financial crises, with economic growth dipping to 6.3% in 2009, but rising to 7.2% in 2011 and 7.4% in 2012. The strong economic growth continues to be driven mainly by foreign-financed projects, large aid inflows and increased investment in mineral resources, industry, services and agriculture. The progressive increase in coal production, and implementation of large infrastructure projects are expected to continue to drive the growth to 8.5% in 2013 and 8% in 2014 (African Economy Outlook, 2013). According to recent estimates (May 2013), Mozambique is set to become one of the biggest coal and gas producers in the world, fact that will boost economic growth potential. Similarly, Tanzania's economy has been growing steadily for the past 10 years and has radically changed its inter-sectoral contribution to the GDP. In 2012, the economy expanded by 6.9% which is close to its more recent historical average.

Figure 2: GDP annual growth (%) in Mozambique and Tanzania



Source: World Development Indicator (WDI).

However, despite its strong and sustained past economic growth, the Mozambican economy has undergone minimal structural transformation. Its productive base remains dependent largely on natural resources, concentrated in a few mega-projects, specifically coal, gas and aluminium. These mega-projects resulted in large FDI inflows, which have driven economic growth but not had a significant impact on government revenues and economic diversification (African Economic Outlook, 2013). The structure of the Mozambique's economy remains narrowly based on subsistence agriculture, which employed about 80% of the economically active population and

accounted for 30.3% of the GDP in 2012. Similarly, the agriculture employed about 75% of the Tanzania's workforce and accounted for 27.5% of the GDP.

The differential growth rates of sectors of economy imply that the share of each sector's contribution to the GDP has evolved over time (Table 1). Whilst the share of agriculture to the GDP has increased in Mozambique, it has declined in Tanzania from 32.9% in 2001 to 27.6% in 2012. The industry sector in Tanzania increased its share by about 6 percentage points, while it decreased by about 3 percentage points in Mozambique. There is a clear trend, in both countries services remains the biggest sector in proportion to the GDP over the course of the past 10 years, the importance of agriculture sector slightly declined in Tanzania.

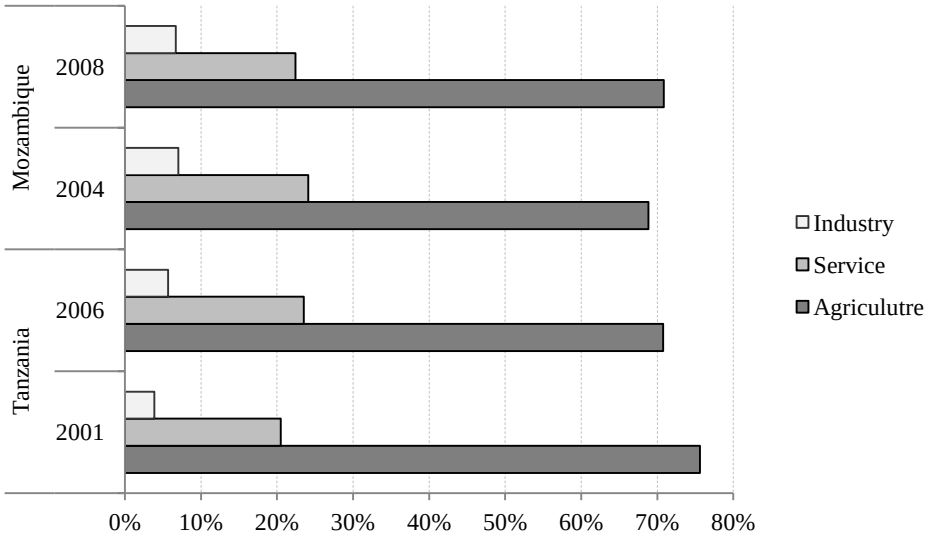
Table 1: Sector performance and economic structure

	2001	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
	Agriculture, value added (% of GDP)											
Mozambique	22.5	27.8	27.3	26.7	26.4	27.1	27.0	28.5	28.8	30.3	30.8	30.3
Tanzania	32.9	32.5	32.5	33.3	31.8	30.4	30.0	29.7	28.8	28.1	27.7	27.6
	Industry, value added (% of GDP)											
Mozambique	25.8	23.1	25.4	26.7	24.8	25.7	25.2	23.9	23.0	22.4	21.7	22.9
Tanzania	19.3	21.1	22.5	22.3	22.7	22.9	23.3	23.1	24.3	24.7	25.1	25.0
	Services, etc., value added (% of GDP)											
Mozambique	51.7	49.0	47.4	46.6	48.9	47.2	47.9	47.6	48.2	47.2	47.5	46.8
Tanzania	47.8	46.5	45.0	44.3	45.5	46.7	46.7	47.2	46.9	47.2	47.2	47.4

Source: World Development Indicator (WDI).

Economic transformation can be view through several outcomes, one of which is a movement of labour out of agriculture into non-agricultural sectors. Disaggregate look at employment data also suggests that in both economies agriculture remains extremely important and the share of the workforce in the agriculture sector remained persistently high, although it dropped by 6 percentage points in Tanzania, reflecting some structural changes (see Figure 3). Industry and service sectors absorbed some of the decline of employment in agriculture as their share of the labour force has increased. The concentration of employment in low-productivity sectors, such as agriculture, indicates that many of the jobs created in Mozambique were of low quality. Industry accounted for about 6-7% and service sector for about 22 and 24%, respectively, of the total employment in the latter period.

Figure 3: Employment in Mozambique and Tanzania by sectors, percent of total employment



Source: Mozambique IFTRAB 2004/05 and IOF 2008/09, and Tanzania 2001, 2006 ILFS.

To further access the quality of jobs, we use distinguish between vulnerable and non-vulnerable employment. The household survey data indicate that the vulnerable employment, calculated as a share of own-account workers and unpaid family workers in the total employment is very high in both Tanzania and Mozambique. It is measured at about 92.7% in Tanzania in 2006 and 90.5% in Mozambique in 2008. To sum up, the data show that the major structural changes in the economic and employment structure in Mozambique and Tanzania were only to a limited extent translated into a higher productivity. Much of the sectoral change in employment in Tanzania has involved shifts from low-quality employment in agriculture to equally low-quality employment in other sectors. In a similar way, we find that Mozambique economy has undergone minimal transformations, and the labour has failed to move from lower to higher productive sectors. The share of the workforce is polarized in the agriculture sector mainly, which employed over 80% of the economically active population in 2008, while that of industry has essentially stagnated at fewer than 5% of all employed. The persistent concentration of employment in low productive sectors, such as agriculture, indicates that many of the jobs created in the country were of low quality.

4. Methodology of Data Analysis

4.1 The Data

The study is based on empirical data from nationally representative household surveys conducted in Mozambique and Tanzania. In particular, the analysis for Mozambique is carried out using data from the the Mozambique Labour Force Survey (IFTRAB 2004/05) and Household Expenditure Surveys (Inquéritoao Orçamento Familiar IOF 2008/09). The IFTRAB 2004/05 sample corresponds to 17,800 households, from which 17,151 households were interviewed at national level, being 8,681 in urban areas and 8,470 in rural areas. The IOF2008/09 is a large, nationally representative survey capturing socio-economic data for 10,832 households and 57,177 individuals. The survey was conducted between September 2008 and August 2009 across all Mozambican provinces. It is typically conducted every five years since it first started in 1997, and constitutes the official base data for monitoring and evaluation of the poverty rate in Mozambique. The data collected under these surveys indicate detailed household-level information about the labour service supplied by each member – education, employment status, sector of activity, type of work performed, main source of income, and detailed information about household expenses. Information was collected both at household and individual level. The empirical analysis for Tanzania is based on 2001 and 2006 Integrated Labour Force Surveys (ILFS), which collect detailed information on households in both urban and rural Tanzania. Representative samples of 11,660 and 18,520 households were interviewed in 2001 and 2006 ILFS, respectively.

4.2 Methodology

Decomposition of productivity growth

We develop a framework for the analysis trying to determine whether the increase in educational attainment levels of the labour force accommodates economic changes. An important part of productivity analysis is the estimation of sectoral contributions to aggregate labour productivity growth. We expect, the productivity in the countries of interest differs between sectors and sectoral source of productivity growth have varied over time. To further examine this, the labour productivity component of the growth is decomposed into the following two components: a) within-sector term, which captures the growth of productivity within given sectors and b) between term that captures the contribution of changes in the pattern of employment across sectors to productivity growth. The decomposition considers that an increase in the labour productivity can result from either productivity improvements within the sector or from reallocation of jobs across sectors, i.e. from low- to high-productivity sectors (ILO, 2013a). More specifically, labour productivity at time t is

given as:

$$A_t = \frac{Y_t}{E_t} = \sum_i \frac{Y_{i,t}}{E_t} = \sum_i \frac{Y_{i,t}}{E_{i,t}} \frac{E_{i,t}}{E_t}$$

Where Y_t is total gross value added, E_t is total employment, $Y_{i,t}$ is output of sector *i* and $E_{i,t}$ is employment in sector i. Decomposition of the growth rate of aggregate labour productivity can be performed using the following relationship:

$$(1) \quad \frac{A_t - A_0}{A_0} = \frac{\sum_i (\frac{Y_{i,t} E_{i,t}}{E_{i,t} E_t}) - \sum_i (\frac{Y_{i,0} E_{i,0}}{E_{i,0} E_0})}{\sum_i (\frac{Y_{i,0} E_{i,0}}{E_{i,0} E_0})} =$$

$$(2) \quad \frac{\sum_i (\frac{Y_{i,t}}{E_{i,t}} - \frac{Y_{i,0}}{E_{i,0}}) \frac{E_{i,t}}{E_t}}{\sum_i (\frac{Y_{i,0} E_{i,0}}{E_{i,0} E_0})} + \frac{\sum_i (\frac{E_{i,t}}{E_t} - \frac{E_{i,0}}{E_0}) \frac{Y_{i,0}}{E_{i,0}}}{\sum_i (\frac{Y_{i,0} E_{i,0}}{E_{i,0} E_0})}$$

Where the first term in (2) captures the within-sector effect and the second term captures the between effect. The within sector effect is the difference between sectoral value-added growth and employment growth weighted by the output share of the sector, holding constant employment reallocation among sectors. Positive within-sector effect results when sectoral value added grows faster than sectoral employment. The between effect is the difference between sectoral output and employment shares multiplied by sectoral employment growth, holding constant labour productivity growth within sectors. Positive between effect results when sectoral employment growth in sectors for which the difference between sectoral output and employment shares is positive (Kucera and Roncolato, 2012). The World Development Indicator (WDI) database is the source of value-added by industry data and the household surveys are the source of employment data.

Decomposition of education intensity

The paper further allows determining whether the increase in educational attainment levels of the labour force accommodates structural changes in the economies. Changes in the distribution of education across sectors can be driven by the change in average educational attainment within sectors and changes in employment structure across sectors, which would lead to a change in the distribution of education within the economy. Following Sparreboom and Abdullaev (2013), education intensity within each sector, i.e. share of workers with certain level of education is

decomposed into components that capture the effect of the two drivers of changes in the distribution of education 'within' and 'between' sector effects. More specifically, the shift-share decomposition used for the analysis of education intensity is defined as:

$$I_t^{\gamma} = \frac{E_t^{\gamma}}{E_t} = \sum_i \frac{E_{i,t}^{\gamma}}{E_t} = \sum_i \left(\frac{E_{i,t}^{\gamma} E_{i,t}}{E_{i,t} E_t} \right)$$

Where $E_t^{\gamma} = \sum_i E_{i,t}^{\gamma}$ the number of workers with is at least γ level of education, E_t is total employment, $E_{i,t}^{\gamma}$ is the number of workers with at least γ level of education in sector *i*, and $E_{i,t}$ is employment in sector *i*. Percentage point change in education intensity is decomposed by using the following relationship:

(1) $I_t^{\gamma} - I_0^{\gamma} =$

(2) $\sum_i \left(\frac{E_{i,t}^{\gamma} E_{i,t}}{E_{i,t} E_t} \right) - \sum_i \left(\frac{E_{i,0}^{\gamma} E_{i,0}}{E_{i,0} E_0} \right) =$

(3) $\sum_i \left(\frac{E_{i,t}^{\gamma}}{E_{i,t}} - \frac{E_{i,0}^{\gamma}}{E_{i,0}} \right) \frac{E_{i,t}}{E_t} - \sum_i \left(\frac{E_{i,t}}{E_t} - \frac{E_{i,0}}{E_0} \right) \frac{E_{i,0}^{\gamma}}{E_{i,0}}$

Where the first term in (3) captures the within effect and the second term captures the between effect. The 'within effect' captures the percentage point contribution of sectors to change in aggregate intensity due to a change in the intensity within each sector, and the 'between effect' captures the percentage point contribution of each sector to aggregate change in education intensity due to movement of labour across sectors. Accordingly, positive within sector effect results when the growth of the share of educated employment exceeds growth of total employment in this sector. A positive between effects are achieved when sectors grow with shares of educated workers above average education intensity in total employment. The approach allows to address which sector contribute most to changes in educated employment and to decent employment and to what extent do the within and between effects account for the changes in educational intensity of employment. Education intensity in the estimations below measures the share of workers with at least lower secondary education or higher within each broad sector category. The change in education intensity of employed workers is therefore assumed to indicate a change in the nature of jobs. An increase in education intensity of workers in a sector, suggests the creation of good jobs, while a decrease suggests that more jobs were created with low levels of productivity (Sparreboom and Abdullaev, 2013).

Non-agricultural sector employment

We further investigate the importance of education through modelling sectoral employment decision and using the following probability model:

$$y_i^* = \alpha + \beta Educ_i + \gamma Time_t + \delta Educ_i * Time_t + \varphi X_i^{'} + \varepsilon_{i,t}$$

where y_i^* is a binary outcome variable measuring employment reallocation and takes the value of one if individual is employed in non-agricultural sector and zero otherwise; $Educ_i$ is a dummy variable that takes the value of one if individual possess secondary or higher education and zero otherwise; $Time_t$ is a dummy that takes the value of one if year=t and zero if t-1; and $Educ_i * Time_t$ is the interaction of the previous two dummies and aims to capture the differential time effect on non-agricultural employment through the increased education; X is vector of explanatory variables related to sectoral employment. The vector of explanatory characteristics includes age, gender, rural settlement, marital status, and indicator for illiteracy, public sector employment dummy, regional dummies and the number of household members less than 18 years of age.

Returns to education

Finally, rate of returns to education is computed by estimating traditional Mincerian specification. In particular, a standard Ordinary Least Squares linear regression model is utilised, where the dependent variable is the natural logarithm of hourly earnings and the independent variables include full range of personal, regional and job related characteristics. Since the Mincerian earnings equation is a log-linear transformation of an exponential function, coefficients have a semi-elasticity interpretation, i.e. the percentage change of the independent variable for any percentage change of the independent variable. Thus, we estimate an equation of the form:

$$\ln(w_i) = \alpha + \beta_s S_i + X_i \delta + \varepsilon$$

Where $\ln(w_i)$ represents the natural logarithm of hourly earnings, S_i is years of obtained schooling, X_i is a vector of individual and workplace characteristics included in the analysis; β_s is the coefficient, which measures the rate of return to one additional year of schooling, and $\varepsilon \sim N(0,\sigma^2)$ is the error term. Hourly earnings are defined as reported monthly earnings in the main job divided by 4.34 and then divided by reported weekly hours of work. Potential experience is estimated as age-6-years of

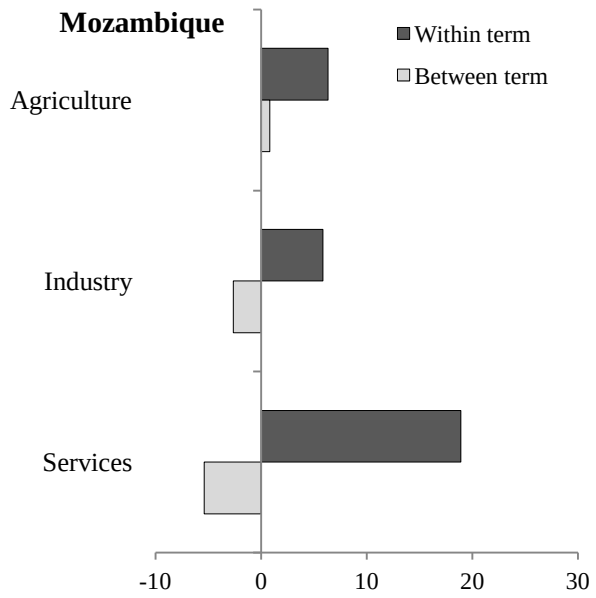
schooling.

5. Empirical analysis

5.1 Decomposing labour productivity of growth

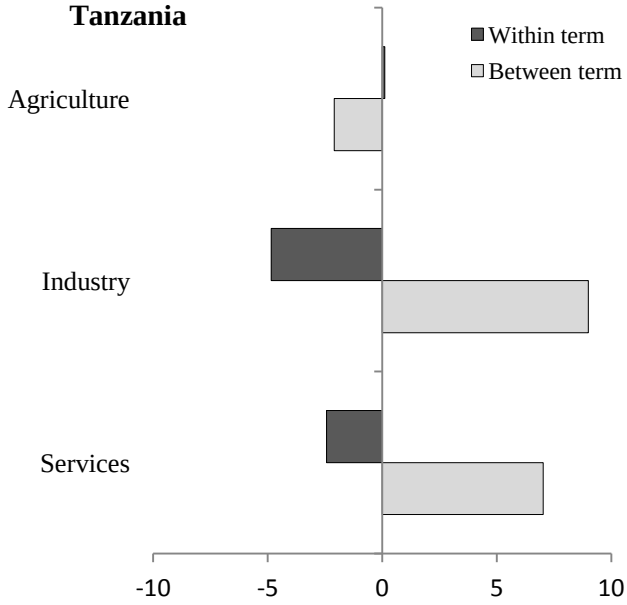
Figures 4 and 5 show the decomposition estimates. The shift-share decomposition of productivity growth in Mozambique reveals that during the period of 2004-2008 industry displays the lowest role in aggregate productivity developments. Service sectors stand out with its higher productivity with a contribution of 0.19 percentage points, followed by agriculture sector. Agriculture accounted for a growth due to both increase in the productivity within the sector and increase in the share in total employment. The between components for industry and service sectors are found to be negative, since the employment share in these sectors were lower in 2008 compared with 2004, while the reverse was true for agriculture. In contrast, we find that productivity growth in Tanzania was almost exclusively due to the between-sector effects and this is in line with Sparreboom and Nubler (2013). The aggregate productivity growth was largely driven by a positive between-sector component which is an indication that sectoral employment in the country grew faster than sectoral value added. The decomposition also reveals that agriculture actually made negative contribution to aggregate productivity growth during the period of 2001-2006. The within components for industry and service sectors are found to be negative, since the employment share in these sectors were higher in 2006 compared with 2001, while the reverse was true for agriculture (Figure 5).

Figure 4: Decomposition of labour productivity growth in Mozambique, 2004-2008, percentage points



Source: GVA by borad sectors is obtained from the WDI databa Mozambique IFTRAB 2004/05 and IOF 2008/09.

Figure 5: Decomposition of labour productivity growth in Tanzania, 2001-2006, percentage points



Source: GVA by borad sectors is obtained from the WDI database, Tanzania ILFS 2001 and 2006.

5.2 Decomposing education intensification

As we already discussed, observed changes in the distribution of education across sectors can be driven by the following two key forces, namely, (i) change in average educational attainment within sectors and (ii) change in the employment structure across sectors, which would subsequently lead to a change in the distribution of education within the economy. To disentangle the effect of each of these factors, education intensity within each sector, i.e. share of workers with at higher than secondary level of education, is decomposed into components that capture the effect of the two corresponding drivers of changes in the distribution of education. The change in these indicators over time provides an indication for the change in the nature of jobs created in the economy and in particular sectors.

Table 2 shows the results of analysis separately for the labour force and for non-vulnerable employment in Mozambique. The share of workers with at least lower secondary education has changed between 2004 and 2008. The change in these indicators over time provides an indication for the change in the nature of jobs created in the economy and in particular sectors. The aggregate education intensity increased from 8.3% to 11.9%, which suggests that, on average, more jobs were

created that employed workers with at least lower secondary education. Growth in the education intensity has been observed in all sectors and in particularly in non-manufacturing and service sectors. The decomposition reveals a negative overall contribution of the between effect to the aggregate education intensity (i.e. effect of movement of labour across sectors and labour market states). Both, the within and between sector effects are positive in agriculture and non-manufacturing sectors, suggesting an increasing productivity of workers in expanding sectors. The final two columns of the table estimate the contribution of each aggregate sector as a percentage to aggregate growth in the education intensity. Clearly, agriculture and service sector absorbed most of the increase in the number of workers with at least lower secondary level of education with a modest contribution of manufacturing and non-manufacturing sectors, and a negative contribution of unemployment. A shift-share analysis of non-vulnerable employment i.e. employment excluding own-account and contributing family-workers, shows that after taking into account changes in employment patterns across sectors in 2004 and 2008, the overall aggregate increase in education intensity among non-vulnerable workers has been due to increased schooling of individuals working in non-manufacturing and service sector. Service sectors accounted for most of the increase in education intensity within non-vulnerable employment with large contribution of services to growth in intensity through the within effect. Education intensity has also increased in agriculture sector but the sector's declining share in the total employment has limited its impact on the education level of the employed non-vulnerable workforce (see Table 2).

Table 2: Education intensification and structural changes by broad sector in Mozambique - lower secondary

	Share of labour force (%)			**Education intensity (%)**			**Between**	**Within**	**Contribution**	**Contribution**
	2004	**2008**	**Change**	**2004**	**2008**	**Change**	**effect**	**effect**	**by sector**	**by sector (%)**
						Labour force				
Agriculture	72.8	76.9	4.2	2.2	5.6	3.4	0.1	2.6	2.7	75.7
Manufacturing	2.8	2.5	-0.3	21.7	26.0	4.3	-0.1	0.1	0.0	1.2
Non-manufacturing	1.8	1.9	0.1	24.3	34.2	10.0	0.0	0.2	0.2	6.2
Services	15.1	14.3	-0.8	32.8	41.9	9.1	-0.3	1.3	1.0	29.1
Unemployed	7.5	4.3	-3.2	9.5	6.6	-2.9	-0.3	-0.1	-0.4	-12.1
Aggregate				**8.3**	**11.9**	**3.6**	**-0.51**	**4.08**	**3.58**	**100.0**
						Non-vulnerable employment				
Agriculture	15.3	11.3	-4.0	5.4	10.1	4.7	-0.2	0.5	0.3	2.5
Manufacturing	10.9	11.1	0.2	29.6	30.9	1.3	0.1	0.1	0.2	1.6
Non-manufacturing	9.0	13.8	4.8	31.5	36.8	5.3	1.5	0.7	2.2	18.1
Services	64.8	63.8	-1.0	45.2	61.0	15.8	-0.5	10.1	9.6	77.7
Aggregate				**36.2**	**48.6**	**12.4**	**0.9**	**11.5**	**12.4**	**100.0**

Source: Authors' estimates from 2004/05 IFTRAB and 2008/09 IOF data. Notes: Unemployment is defined in accordance with 'broad' ILO definition, satisfying the criteria 'without work' and 'currently available for work'.

Table 3 shows the education intensity and structural employment reallocation in Tanzania in 2001 and 2006. Education intensity is found highest in the service sector, and lowest in agriculture. In 2001, only 2.4 percent of workers employed in agriculture had obtained at least lower secondary education, while the percentage of those employed in service and manufacturing sectors was 20.9 and 15.7 percent, respectively. The higher education intensity of jobs in industry and service sectors suggests much higher productivity as compared to the agriculture. The education intensity at the national level increased from 7 to 8.7 percent between 2001 and 2006, which demonstrates that, on average, more jobs employing workers with at least lower secondary education have been created. Furthermore, the analysis shows that the education intensity increased in non-manufacturing sector by 6.8 percentage points and decreased in manufacturing by 2.5 percentage points. The decrease in manufacturing sector might be an indication that employment creation in this sector involved relatively-low skilled jobs. In contrast, the notable increase in education intensity observed in non-manufacturing sector suggests 'good jobs' were created with education intensity above the average intensity in this sector. Columns 7 and 8 in the table present actual results of the decomposition, where the 'between effect' captures the percentage point contribution of each sector to the aggregate change in education intensity due to movement of labour across sectors; and the 'within effect' captures the percentage point contribution of sectors to change in aggregate intensity due to change in the intensity within each sector. The decomposition attributes small proportion of change in aggregate education intensity to the between effect, i.e. effect of movement of labour across sectors and labour market states. The final two columns of the table, which estimate the contribution of each aggregate sector to the aggregate growth in education intensity, show that agriculture and service sectors absorbed most of increase in the number of workers with at least secondary level of education with modest contribution of non-manufacturing industry sectors. Finally, slightly different conclusions may be drawn if change in education intensity is analyzed only within non-vulnerable employment, i.e. employment excluding own-account and contributing family workers. In contrast to the total employment, the share of employment in service sectors decreased from 72.4% in 2001 to 69.5% in 2006, while employment in sectors of agriculture increased. Non-manufacturing and service sectors accounted for most of increase in education intensity within non-vulnerable employment with large contribution of services to growth in intensity through the within effect.

Table 3: Education intensification and structural changes by broad sector in Tanzania - lower secondary

	Share of labour force (%)			**Education intensity (%)**			**Between effect**	**Within effect**	**Contribution by sector**	**Contribution by sector (%)**
	2001	**2006**	**Change**	**2001**	**2006**	**Change**				
						Labour force				
Agriculture	71.8	67.6	-4.2	2.48	3.58	1.1	-0.10	0.74	0.64	37.2
Manufacturing	2.2	3.4	1.2	15.76	13.3	-2.5	0.19	-0.08	0.11	6.4
Non-manufacturing	1.5	2.0	0.5	9.48	16.3	6.8	0.05	0.14	0.19	10.9
Services	19.5	22.4	3.0	20.93	22.39	1.5	0.62	0.33	0.95	55.4
Unemployed	5.1	4.6	-0.5	12.2	9.8	-2.4	-0.06	-0.11	-0.17	-10.0
Aggregate				**7.0**	**8.7**	**1.7**	**0.70**	**1.02**	**1.72**	**100.0**

						Non-vulnerable employment				
Agriculture	10.9	11.7	0.7	7.5	7.8	0.4	0.1	0.0	0.1	4.4
Manufacturing	9.1	10.0	0.9	22.9	20.2	-2.8	0.2	-0.3	-0.1	3.1
Non-manufacturing	7.6	8.9	1.3	13.8	22.3	8.5	0.2	0.8	0.9	42.2
Services	72.4	69.5	-2.9	36.3	39.4	3.1	-1.1	2.2	1.1	50.3
Aggregate				**30.2**	**32.3**	**2.1**	**-0.6**	**2.7**	**2.1**	**100.0**

Source: Authors' estimates from 2001 and 2006 Tanzania ILFS.

5.3 Determinants of non-agricultural sectoral employment

Table 4 presents marginal effects of the probit model of non-agricultural sector employment, where *time* is a dummy that takes the value of one for 2006/2008 and zero for 2001/2004 Tanzanian's and Mozambique's samples, respectively; and *educ*time*, the main coefficient of interest, is the interaction of the education and time dummies. The estimated coefficient of the interaction term is found statistically significant for both countries. We find significant and positive education-time interaction effect on the incidence of non-agricultural employment in Tanzania. More specifically, controlling for some household characteristics, the increase in the probability of non-agricultural labour as a response to the increase in education is of 4.7 percentages. However, we find about 2.9 percentage reduction in the probability that an individual works in non-agricultural sector as a consequence of the education expansion in Mozambique. The result shows that as a response of expanding education over time, Tanzanian households are more likely to work in non-agriculture sector, whereas the households in Mozambique continue to be employed predominantly in the agriculture sector. The coefficients on the other control variables show patterns that seem to be consistent with our expectations. For instance, individuals are less likely to work in non-agriculture sector if they live in rural areas.

Table 4: Marginal effects of non-agricultural employment in Tanzania and Mozambique

Dep.var.: reallocation		
	Tanzania	Mozambique
	Coefficient	*Coefficient*
time	0.0580***	-0.0552***
	(0.0053)	(0.0055)
educ	0.0745***	0.1624***
	(0.0144)	(0.0127)
educ*time	0.0467***	-0.0298**
	(0.0175)	(0.0134)
age	0.0126***	0.0184***
	(0.0011)	(0.0013)
agesq	-0.0002***	-0.0003***
	(0.0000)	(0.0000)
male	0.0546***	0.2420***
	(0.0043)	(0.0056)
hsize18	-0.0041***	-0.0174***
	(0.0011)	(0.0015)
iliterate	0.0088***	-0.1411***
	(0.0053)	(0.0055)
rural	-0.5104***	-0.3957***
	(0.0050)	(0.0049)
public	0.7552***	0.7722***
	(0.0068)	(0.0077)
married	-0.0454***	-0.0694***
	(0.0077)	(0.0101)
single	0.0088	-0.0108
	(0.0094)	(0.0120)
regional dummies	Yes	Yes
N	60652	51152
Pseudo R2	0.4405	0.518
Log likelihood	-19854	-15262.6

Notes: t statistics in parentheses * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

5.4 Returns to education across sectors-empirical estimates

To further quantify educations within sector contribution to the growth, we consider that education affects growth through increasing human capital of workers- possibly at different rates in each sector. Education not only would facilitate the reallocation of labour from agricultural jobs to higher-productivity non-agricultural jobs, but it also would lead to a greater labour productivity by increased human capital Therefore, returns to education by sector is estimated. Returns to education in both countries were estimated using two measures of schooling – total years of schooling, and levels of attained education. The coefficient of the years of schooling can be considered a direct measure of the internal private rate of return to a year of education. The latter provides estimate of difference in earnings between individuals who have attained a certain level of education measured relative to those

with no formal education. The dependent variable in the analysis is the logarithm of hourly earnings resulting from the primary occupation of the individuals and excludes earnings from secondary jobs. The vector of exogenous control variables used in the estimations also includes potential experience (linear and quadratic terms), urban residence and gender. Years of schooling takes four different values: from 0 if individual have achieved no education to 15 if individual have achieved tertiary level. Results of analysis separately for the overall sample and for non-vulnerable employees are presented.

Estimates of return to one additional year of schooling for the overall economy and separately for non-vulnerable employees across broad sectors are reported in Table 5. By looking at two time points, we also allow for the possibility that education's impact on earnings may have changed over time. The return is estimated to be about 21% on average over the whole 2004 sample. Results also show that return to education has significantly declined during the period of 2004 and 2008, which is in line with some other studies. Schultz (2004) finds similar results for Cote d'Ivoire, Ghana, Kenya and Nigeria. A study by the World Bank (2006) finds the same results for Uganda. We find that that the average returns to education in Mozambique have declined from 20.7% for an extra year of schooling in 2004 to 15.8% in 2008 and the difference between returns to education over 2004-2008 is statistically significant. In addition, return to an additional year of schooling systematically differs across broad sector categories. Employment in the agriculture has resulted in the lowest return to education. The estimated rates of returns to education based on the non-vulnerable employment sample do not differ significantly as compared to the initial estimates and show a similar decreasing trend during the period being examined.

Table 5: Returns to education in Mozambique, years in schooling

	All sectors	**Agriculture**	**Manufacturing**	**Mining & construction**	**Services**
	All employees				
2004	0.2069***	0.0786***	0.1766***	0.1454***	0.2314***
	(54.98)	(5.35)	(13.85)	(9.35)	(53.01)
2008	0.1583***	0.0854***	0.1147***	0.0902***	0.1877***
	(32.8)	(4.62)	(7.45)	(5.75)	(33.63)
	Non-vulnerable employees				
2004	0.2080***	0.0818***	0.1810***	0.1422***	0.2326***
	(53.98)	(5.23)	(13.83)	(9.15)	(52.59)
2008	0.1556***	0.0736***	0.1155***	0.0903***	0.1802***
	(28.97)	(3.68)	(7.38)	(5.05)	(27.53)

Notes: t statistics in parentheses * $p< 0.10$, ** $p< 0.05$, *** $p< 0.01$. Earnings are measured in log hourly earnings. Estimation of the earnings functions is by ordinary least squares (OLS). *Source:* Author's calculations using the IFTRAB 2004/2005 and 2008/09 IOF data.

There are several possible reasons that could lead to a decline in returns to education. We focus on the potential reasons for this decline in Mozambican context. Given the rising enrolment rates in the

country, which by itself could have depressed wages, we might expect returns to education to fall gradually with policy changes. Some authors have viewed these developments as evidence that either the push for rapid expansion of primary education has been a failure, or that labour market is not functioning well (Fox and Gaal, 2008). Lopez-Calva and Lusting (2010) show that the most important factor behind the decline in the returns to education has been an increase in the relative supply of workers with completed secondary and tertiary education, a result of significant educational upgrading that took place in Latin America during the 1990s. This is supported by Azevedo et al. (2013), who suggest that the decline in the skill premium has been driven by an increase in the supply of experienced and educated workers in the region. The decrease in rates of return to education, found in the current study, could also be linked to the peculiar development path the country has undergone. In this context, some recent studies show that rates of return start declining once higher levels of development have been achieved. In particular, during the 2000s, in Ecuador, Brazil, Paraguay, Peru and Chile, where the overall inequality declined, the return to primary, secondary and tertiary education versus no schooling or incomplete primary schooling declined (Lusting et al., 2013). Unless the growth of physical capital kept up or technological change took place, returns had to fall. Thus, the falling return to higher education is evidence of positive economic development – a labour force where the share of the workforce with some primary education is rising (Fox et al., 2008).

Table 6 indicates that across all sectors the rate of return to schooling in Tanzania is close to 14 percent in both 2001 and 2006. It decreased from 18 percent in 2001 to almost 13 percent in 2006 for the non-vulnerable sample. The lowest are the estimated returns in the agriculture and insignificant in mining and construction service. The fall in returns in manufacturing for non-vulnerable employed is consistent with the pattern of change in education intensity in non-vulnerable employment between 2001 and 2006.

Table 6: Returns to education in Tanzania, years in schooling

	All sectors	Agriculture	Manufacturing	Mining & construction	Services
	All employees				
2001	0.1401***	0.0698***	0.1208***	0.0513	0.1624***
	(36.43)	(9.16)	(7.83)	(0.64)	(33.93)
2006	0.1405***	0.0368***	0.1476***	-0.0398	0.1381***
	(18.99)	(3.88)	(3.08)	(-0.35)	10.47)
	Non-vulnerable employees				
2001	0.1817***	0.1058***	0.1445***	0.0266	0.1946***
	(37.35)	(6.17)	7.82)	(0.29)	(35.29)
2006	0.1271***	0.0667***	0.1120**	-0.029	0.1302***
	(11.71)	(3.24)	(2.41)	(-0.31)	(9.07)

Notes: t statistics in parentheses * $p< 0.10$, ** $p< 0.05$, *** $p< 0.01$. Earnings are measured in log hourly earnings. Estimation of the earnings functions is by ordinary least squares (OLS). *Source:* Author's calculations using 2001 and 2006 ILFS data.

6. Conclusion

This paper explores the patterns of structural transformation and changes in educational attainment and employment in Mozambique and Tanzania. In particular, an insight regarding the role of education and structural change is gained from analysis of the changes in industry distributions. By using education intensity as an indicator for the quality of job being created, the paper determines sectors contribution to the changes in employment and the extent to which changes in productivity are accounted for by the within and between-sector effects.

Successful economic transformation is associated with a labour reallocation out of the rural agriculture sector into urban industrial sector, leading to higher productivity levels and progressively rising income levels. However, this has not been observed in Mozambique. Despite its strong and sustained economic growth, the economy has undergone minimal structural transformations, and the labour has failed to move from lower to higher productive sectors. The agriculture, which employed over 80% of the economically active population in 2008, remains extremely important for the country. The share of industry has essentially stagnated at fewer than 6% of all employed. In Tanzania, however, the employment in agriculture dropped by 6 percentage points, reflecting some structural changes. Industry and service sectors have absorbed most of the relative decline of employment in agriculture as their share of the labour force has increased.

Decomposing labour productivity of the growth in Mozambique reveals that during the period of 2004-2008, service sector stands out with its higher productivity, followed by the agriculture sector. The findings in the literature for developing countries as a whole show, that labour productivity growth is driven as much by service as by industry. Despite the higher within sector labour

productivity growth in the service sector, the current study finds that it actually contributed negatively to the aggregate productivity growth in Mozambique due to decline of its role in the total employment. Agriculture accounted for the growth due to both increase in productivity within the sector and increase in the share in total employment. In contrast, we find that aggregate productivity growth in Tanzania was largely driven by a positive between-sector component, which reveals that sectoral employment in the country grew faster than sectoral value added.

Furthermore, using education intensity as an indicator for the quality of jobs, the paper finds an increase in education intensity in both countries, which demonstrated that, on average, more jobs employed workers with at least secondary education has been created. The paper also finds a higher relative importance of the within-sector effect in Mozambique, which foremost is an indication for a narrow 'enclave development path' where transformation has happened in a very small part of the economy. In effect, Mozambique's growth can be described as largely non-inclusive because of its limited contribution to job creation and overall economic improvement.

It is also found that across all sectors, the average returns to education in Mozambique decreased between 2004 and 2008. This decline in the estimated rates of return to education also confirms the peculiar development path in the country. A similar pattern is observed for non-vulnerable employees in Tanzania, where the returns to education at national level decreased from 18.2 percent in 2001 in 12.7 percent in 2006.

The findings provide some important policy conclusions and specifically the design of macroeconomic policies on some sectors in Tanzania and Mozambique deserves a particular attention. Economic policies need to address structural transformation and in particular shifting the labour away from subsistence agriculture towards more innovative activities and dynamic sectors and facilitating the human capital within sectors.

References

African Economic Outlook (2013) Structural Transformation and Natural Resources. OECD Development Centre/United Nations Development Programme.

Azevedo, J., M. Dávalos, C. Diaz-Bonilla, B. Atuesta,, and R. Castañeda (2013) Fifteen years of inequality in Latin America: How have labour market helped? Policy Research Working Paper 6384, The World Bank.

Bartholomew, A., Takala, T., and Ahmed, Z. (2009) Mid-term evaluation of the EFA Fast Track Initiative, Country Case Study: Mozambique.

Bils, M. and Klenow, P. (2000) Does schooling cause growth?, American economic review. p.1160--1183

Biggs, T. (2012) Mozambique's coming natural resource boom. Expectations, vulnerability and policies for successful management, CTA.

Brück, T., and van den Broeck, K. (2006) Growth, employment and poverty in Mozambique, *Issues in Employment and Poverty Discussion Paper No.* 21.

Carvalho, P. (2012) Mozambique – repositioning in the international arena. Banco BPI.S.A.

Clark, D. (2006) The Elgar companion to development studies, Edward Elgar Publishing.

Colclough, C.; Kingdon, G.; Patrinos, H. 2010. 'The changing Pattern of Wage Returns to Education and its Implications', *Development Policy Review*, Vol. 28, No. 6, pp. 733-747.

Dearden, L., McGranahan, L. and Sianesi, B. (2004) An in-depth analysis of the returns to National vocational qualifications obtained at level2, mimeo, Institute of Fiscal Studies.

Fox, L., Benefica, R., Ehrenpreis, M., Gaal, M., Nordang, H., Owen, D. (2008) Beating the odds: Sustaining inclusion in a growing economy: A Mozambique Poverty, gender and social assessment, World Bank, Washington, DC.

Fox, L., Santibañez, L., Nguyen, V., André, P. (2012) Education reform in Mozambique: Lessons and challenges, Human Development 68361, World Bank, Washington, DC.

Education for All- Fast Track Initiative (2004), Accelerating progress towards quality universal primary education: framework.

Gondwe, M. (2011) Alignment of higher professional education with the needs of local labour market: The case of Mozambique, Netherlands organisation for international cooperation in higher education.

Gonzales, N., Oyelere, R. (2009) Are returns to education on the decline in Venezuela and does mission sucre have a role to play? *IZA Discussion Paper No*.4206.

Hanushek, E. and Kimko, D. (2000) Schooling, labor-force quality, and the growth of nations, American economic review, p.1184—1208.

Human Development Report (2013) The Rise of the South: Human Progress in a Diverse World, Mozambique.

IMF Country Report, Mozambique (2010) No. 10/375 IMF Washington, D.C.

ILO (2008) Policy coherence for generating employment and decent work in Mozambique, background paper for the High Level Forum on 'Working out on poverty: A decent work approach to development and growth in Africa', September 8-9, 2008, Monrovia, Liberia, International Labour Office, Geneva.

ILO (2012) International Standard Classification of Occupations: ISCO-08 (Geneva).

ILO (2013a) Global Employment Trends 2013. Recovering from a second job dip, International Labour Office (Geneva).

ILO (2013b) Global Employment Trends for Youth 2013. A generation at risk, International Labour Office (Geneva).

Jones, S., and Tarp, F. (2013) *Jobs and welfare in Mozambique*, WIDER Working Paper Vol. 2013/045, UNU-WIDER, April 2013

Report on the Millennium Development Goals: Mozambique 2010, Universal primary education situation and trends, United Nations Development Program.

Republic of Mozambique (2011) Poverty Reduction Action Plan (PARP) 2011-2014 (Maputo).

Roncolato, L. and Kucera, D. (2013) Structural drivers of productivity and employment growth: A decomposition analysis for 81 countries, *Cambridge Journal of Economics*, 1-26.

Kaldor, N. (1967) Strategic factors in economic development, Ithaca, Cornell University Press.

King, E., and Hill, A. (1993) Women's education in developing countries: Barriers, benefits, and policies, The International Bank for Reconstructions and Development/ The World Bank.

Kucera, D. and Roncolato, L. (2012) Structure matters: Sectoral drivers of growth and the labour-productivity-employment relationship, ILO Research Paper No.3.

López-Calva, L. and Lustig, N. (2010) Declining inequality in Latin America: A decade of progress? Washington, D.C.: Brookings Institution and UNDP.

Lee, S. and Malin, B. (2013) Education's role in China's structural transformation, Journal of Development Economics, 101, p.148—166.

Lobo, M. (2010) Impact of the financial crisis on education sector spending and government policy responses: Case note (Mozambique), Background paper prepared for the Education for All Global Monitoring Report 2011.

Lustig, N.; Lopez-Calva, L. and Ortiz-Juarez, E. (2013) Deconstructing the Decline in Inequality in Latin America, Policy Research Working Paper, No. 6552, World Bank, Washington, D.C.

Martins, P. (2013) Growth, employment and poverty in Africa: Tales of lions and cheetahs, Background Paper for the World Development Report.

Muzima, J. (2007) Returns to experience in Mozambique: A nonparametric regression approach, IESE, Conference Paper No.27.

Muzima, J. (2007) Some brief notes on the IFTRAB 2004-05 data, Maputo, 19th June 2007.

OECD (2001) Measuring productivity – OECD Manuel: measurement of aggregate and industry-level productivity growth.

Purnastutia, L., Millerb, P. and Salim, R. (2013) Declining rates of return to education: evidence from Indonesia, Bulletin on Indonesian Economic Studies, Vol. 49, Issue 2, p.213-236.

Simone, F. (2009) Returns to Education in Mozambique: Learning from a Quasi-Experiment, unpublished manuscript.

Schultz, P. (2004) Evidence of returns to schooling in Africa from household surveys: monitoring and restructuring the market for education, Journal of African Economies, 13 (Suppl 2), p. 95-148.

Sparreboom, T. (2011) Vulnerable employment, in 'Towards decent work in sub-Saharan Africa Monitoring MDG Employment Indicators', (edited by Sparreboom, T. and Albee, A.), ILO.

Sparreboom, T., and Abdullaev, U. (2013) Productive transformation, employment and education in Namibia. International Labour Office (Geneva), forthcoming.

Sparreboom, T., and Nübler, I. (2013) Productive transformation, employment and education in Tanzania, paper presented at the *2013 UNU-WIDER Development Conference on Learning to Compete: Industrial Development and Policy in Africa*, 24-25 June, Helsinki.

Sparreboom, T., and Tarvid, A. (2013) Job polarization and skills mismatch in Europe, International Labour Office (Geneva), forthcoming.

Strategic Plan for Education and Culture in Mozambique, 2006-2010/11 (2009) World Bank, Washington, DC.

Stigler, G. (1961) The Economic of information, in *Journal of Political Economy*, Vo.69, N.33,p. 213-225.

Timmer, P and Selvin, A. (2008) The structural transformation as a pathway out of poverty: analytics, empirics and politics, Center for Global Development Working Paper, 150: 1461.

UNESCO (2008) Report on the Millennium Development goals, Republic of Mozambique.

UNESCO Institute for Statistics Database: http://stats.uis.unesco.org.

UNESCO (2008) Education for all by 2015. Will we make it? Education for All Global Monitoring Report.

UNESCO (2012) Mozambique EFA country profile, Dakar Office.

World Bank (2003) Pilot investment climate assessment: Mozambique industrial performance and investment climate 2003, World Bank, Washington, DC.

World Bank (2004) Poverty and Social Impact Analysis, World Bank, Washington, DC.

World Bank (2005) Poverty and Social Impact Analysis: Primary school enrolment and retention – the impact of social fees, World Bank, Washington, DC.

World Bank (2006) Uganda poverty and vulnerability assessment, Sector Report No. 26996, Poverty Reduction and economic Management, Washington, DC.

World Bank (2008a) Expanding the possible in Su-Saharan Africa: How tertiary institutions an increase growth and competitiveness. Poverty reduction and Economic Management (PREM), Washington, DC.

World Bank (2008b) Mozambique - Education and Manpower Development Project; Second Education Project; Capacity Building Human Resources Development Project; and Education Sector Strategic Program Project. Washington D.C. - The World Bank.

World Bank (2009) Abolishing school fees in Africa: Lessons from Ethiopia, Ghana, Kenya, Malawi, and Mozambique, Development Practice in Education, World Bank with collaboration with UNICEF.

World Bank (2010) World data on education, 7th Edition, IBE/2010/CPI/WDE/MZ.

Vollmer, F. (2013) Mozambique´s Economic Transformation. Are efforts to streamline the fragmented aid landscape undermined for good? DIE: German Development Institute, Bonn.