

# Is Uganda's Growth Profile Jobless?

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## Abstract

We establish the relationship between economic growth and employment in Uganda (2006–2011). We obtained data from World Development Indicators, Uganda National Household Panel Survey (2011) and United Nations Statistical Data Base and we adopted the Job Generation and Decomposition (JoGGs) Tool of the World Bank for the analysis. The growth profile for the period 2006–2011 was jobless as evidenced by 36% change in per capita GDP emerging from a decrease in the employment rate. Agricultural sector registered the greatest dampening effect on overall value added per person and to the share of the employed in the population of working age by 31% and 6.5%, respectively. Manufacturing sector contributed positively to the change in per capita GDP by 8% but negatively to change in total employment rate by 0.2%. Positive contributions to the employment rate and per capita GDP were observed in the services and industrial sectors. It is further noted that productivity or output per worker contributed over 100% to the overall growth in value added per person. In terms of labor productivity, the lowest was in the agricultural sector and the highest was in the industry followed by the services sector. The inter-sectoral shifts positively contributed to labor productivity which implies that there was a relocation of labor from less efficient to more efficient sectors. The demographic transition is a promising source of increase in per capita income; the dependence ratio has reduced and this has clear dampening effect on poverty.

**Keywords:** growth, employment, productivity, poverty

## 1. Introduction and Study Concern

The role of employment in poverty reduction and welfare improvements cannot be underscored given that unemployment and underemployment are major causes and consequences of widespread poverty (Sodipe et al., 2011). Indeed, the attainment of a decent and fruitful job opportunity yields an amount of income that ensures a socially acceptable standard of living as well as the possibility of saving and investing for individual economic progress (ILO et al., 2012). Most of the poor in less developed countries earn a living by availing themselves for employment either through self-employment or paid employment; making employment an important channel through which economic growth impacts poverty (Fox and Gaal, 2008). Consequently, the extent to which a country's growth profile is poverty dampening is contingent upon the degree to which growth is creating decent employment opportunities. Therefore, there is a great need for a strong employment component in a country's development policy options that targets the enhancement of output per worker for the poorest employees and the sustainability of the productive employment opportunity by establishing working labor market institutions (ILO et al., 2012). In line with these arguments, employment is an important conduit for the attainment poverty reduction, accelerated sustainable growth that is inclusive and equitable. According ILO et al. (2012) as people's standards of living improve as a result of attaining decent and productive employment, their distaste against corruption and interest in a free and fair political system increases as well as a high possibility of accessing high quality health and education services for themselves and their children. There is little wonder then that many countries around the world are taking purposeful efforts of attaining economic growth that is employment enhancing particularly for the vulnerable groups; the youth and women.

It is noteworthy that the Ugandan economy has exhibited a strong growth stance since the nineties. The GDP average yearly growth was 6.86% (1990–1999), 5.52% (2000–2005), and 7.7% (2006–2010) (UBOS, Statistical Abstract 2010). This may be attributed to a number of fundamental changes that the government has implemented over the period. These include among others; improving the investment climate and attracting foreign direct investment, improving the quality of labor force through universal primary and secondary

education and completely eliminating the red tape in the business environment in order to reduce the cost of doing business. These reforms have generated major changes in the drivers of the economy with the services sector (over 52% of GDP) and the industrial sector (over 25% of GDP) playing a more dominant role than the agricultural sector (less than 14% of GDP). It is noteworthy that the economy has experienced sectoral shifts in GDP composition but with no sectoral shifts in employment. For example, the agricultural sector still employs approximately 70% of the labour force in the country. On the other hand, the services and manufacturing sectors employ 24% and 6%, respectively (UNHS 2009/10). This pattern implies that the participants in the agricultural sector get meager returns to their labour and hence suffer from biting poverty. On the other hand it might be the case that there are intra-sectoral shifts within the agricultural sector such that workers keep moving from less profitable activities to more profitable ones. Therefore, understanding the dynamics within (intra-sectoral shifts) and between (inter-sectoral) sectors shall enable government to design appropriate policies that can uplift workers from poverty through productivity enhancement.

The informal sector is by far the greatest employer in Uganda. For example 3.5 million people derive their income from informal activities; household enterprises in agriculture and other activities like trade, crafts among others. The later employed up to 2.1 million people (UNHS, 2009/10). Consequently, unemployment is seemingly no longer the problem in Uganda as evidenced by the low unemployment rates recorded recently; 3.5% (UNHS, 2002/03, 1.9% (UNHS, 2005/06) and 3.5% (UNHS, 2009/10). As per the ILO definition of unemployment, the total number of unemployed population increased from 0.3 million in 2002–03 to 0.5 million in 2009–10. Due to high poverty levels, the low unemployment statistics are expected in developing countries like Uganda. The poor are forced to engage in any income generating activity even with low work intensity and low wages in the informal sector— in order to make ends meet. Consequently, the informal sector has become more assertive, with self-employment, part-time employment, and unpaid employment in family enterprises being dominant components of the overall employment (UNHS, 2009/10). As a result, the unemployment figures in Uganda somewhat portray a pseudo picture rather than a vivid lack of employment opportunity that can absorb the job seekers. Consequently, other measures of labor market outcomes such as time-related underemployment are called for in order to help reflect the situation at hand. Time-related underemployment occurs in a situation where a person who is willing and available to work more hours, works for less than 40 hours a week (UNHS, 2009/10). According to the UNHS Report (2009/10), underemployment has declined since 2002; the underemployment rate was 4% in 2009/10 compared to 12% in 2005/06 and 17% in 2002/03.

Despite these enormous reforms and structural changes in the economy, employment enhancement has lagged behind the speed at which growth has been taking place indicating a jobless growth profile in Uganda. It is not surprising therefore that Uganda's impressive growth has reduced headcount poverty only by slightly more than a quarter of its level for period 2002–2010. Headcount poverty decreased from 38.8% in 2002/03 to 31.1% in 2005/06 and to 24.5% in 2009/10. In absolute terms, this translates to 9.8 million (2002/03), 8.44 million (2005/06) and 7.5 million (2009/10) living below the poverty line (UNHS, 2009/10). It is the slow pace at which people were being moved out of poverty that led to the realization by many poor countries and their development partners that employment creation is a crucial aspect of any growth agenda. In the same line of argument, the issue of employment intensity of growth has attracted considerable attention in the literature. This is despite the fact that, hitherto, employment-economic growth nexus had not been lent an empirical regularity for the case of Uganda. This paper is therefore an attempt to fill this gap and answers the following pertinent questions. i) Is Uganda's growth profile employment generating? What is the contribution of output per worker to growth enhancement? ii) What is the sectoral composition of growth and how is it related to employment generation? iii) What contributes to changes in labor productivity? Findings that will be obtained from an empirical analysis of these questions will be instrumental to understanding whether Uganda experienced a jobless or job creating episode of growth and will shed light on the sectors that are responsible for it. This paper is expected to trigger public policy dialogues and debates which may provide the government with alternative policy options that can lift the country from poverty emerging from unemployment and underemployment problems.

This reminder of this article is: section 2 gives a summary of the relevant literature, section 3 presents the methodology and data issues; 4 gives the findings and section 5 concludes with implications for policy.

## 2. Literature Review

Quite extensive strand of literature answers the question of whether a country's growth profile is jobless or job creating. Melamed et al., (2011) undertakes a rigorous assessment of the most recent empirical works highlighting the key insights the different authors have provided on the growth employment nexus. This blend of literature underscores the differential importance of the different sectors of the economy in generating gainful employment. A substantial strand of literature supports the view that the services sector has come to the forefront

of generating gainful employment in many countries; an issue that is practically observable in Uganda's economy. This view is supported by Kapsos (2005) who contends that if the services sector becomes more important in the economy, more employment opportunities are bound to be created than when agriculture or manufacturing take a front position in the economy.

Huong et al. (2006) documents that for the case of Vietnam employment opportunities in the services sector were more income generating than employment opportunities in manufacturing. Ravallion (2009) also documents that the services played a dominant role in poverty reduction in Brazil, however, in China; the growth in the agricultural sector was more paramount. The author also contends that in contrast to China whose poverty reduction benefited more from agricultural growth, in India the services sector was more powerful. Demeke et al. (2006) showed that the growth of the overall economy was to a very big extent originating from the services sector for the period 1960–2002 and hence absorbed much of the growing labour force in Ethiopia during the 1990s when the agricultural sector suffered a retardation. Fox and Gaal (2008) argue that expansion in formal employment can potentially benefit from the growth in exports from industrial and service sectors. The authors contend that, of recent, the growth drivers have changed in favor of the service sector and labor force has followed thus it might generate more employment than agriculture and manufacturing. However, Melamed et al., (2011) notes the inter-linkages and synergies that exist amongst sectors as far as job creation is concerned. The authors therefore argue that a set of strategies must not focus on any sector in isolation of others for a sustainable impact. Loayza et al. (2010) show that in their potential to reduce poverty, agriculture is leading other sectors followed by construction and manufacturing, however, mining, utilities and services don't seem to dampen poverty. Khan (2008) documents the case of East Asian pioneers where rapid growth of industries and modern services absorbed more workers in such activities that were highly paying and more efficient and at the same time these successful sectors enhanced the productivity of employee left behind in agriculture and other traditional activities.

Another strand of literature shows that the phenomenon of jobless growth is persistent in many countries (Melamed et al., 2011). Aryeetey et al. (2007) contend that, for the case of Ghana, policy options laid over proportionate attention on macroeconomic balance and faster economic growth and overly ignored employment creation leading to a jobless growth. Jobless growth is also visible in the recent times of India (Mehta et al., 2011), and the same applies to Latin America (Jemio et al., 2006). Mehta et al. (2011) observes dependence on agriculture seems to have become a poverty trap for many, especially in the wake of the jobless growth since the mid-1990s. Melamed et al., (2011) presents two channels through which growth can be poverty dampening via the labour market. According to these authors the changes in the sectoral composition of growth and the associated inter-sectoral shifts have to lead to an improvement of efficiency and demand for labor. The authors further contend that an expansion in employment that is not matched by simultaneous efficiency gains increases the number of working poor due to the fact that wages stagnate with low productivity. Gutierrez et al. (2009) supports this argument by showing that changes in the sectoral composition of growth and productivity may have an important bearing on poverty reduction while Kapsos (2005) shows that in East Asia, rapid economic growth has been accompanied by substantial increases in labour efficiency leading to higher income levels and sustainable employment growth. Therefore, decent employment should be the key to labour market policy than generating employment per se (Fields, 2007).

Recent literature also highlights the important inequalities in the labour market by age and gender of the players (Melamed et al., 2011). It has been documented by Kapsos (2005) that the youthful workers have been prone to consistently low employment intensity of growth. This view is supported by Ernst (2008) who shows that the youth (15–24 years) comprise of 25% of the labour force but contribute a large 44% of the unemployed and 20% of workers below one dollar a day poverty line. Other authors document the fact that youth unemployment is many times higher than that of the adult counterparts (ILO, 2011). Zependa (2007) contends that unemployment is highest particularly among the youth (15–24 years) and mature educated workers (55–64 years). Messkoub (2008) documents that, for the case of Middle East and North Africa region, the youth are more susceptible to the problems of poverty and unemployment. There is need to exploit the opportunities presented by the demographic transition in order to avert the demographic disaster. Countries need to look at the youth as a strong force of men and women that are dynamic, energetic and able to work for long hours and hence leading to a quicker economic transformation. The inequality along the gender dimension also stands out in the literature. It has been documented by several authors that the probability of being employed in the formal sector is highest for men compared to their female counterparts and that men are more likely to earn a higher wage (ILO, 2011; Rahman et al., 2006; Zependa, 2007). In the same vein, Heintz, (2005) indicates substantial labor force segmentation in Ghana where women disproportionately represented in more unsafe forms of employment. According to

Melamed et al. (2011), gender inequality in the labour market has been more researched than the inequality between the young and old workers. Against this backdrop therefore, it is much more important than ever before to critically examine the labor market dynamics and outcomes for the youth. The big number of the youth in many economies should be viewed more of a blessing than a curse for the future development of any one country provided ample employment opportunities for the youth are available.

### 3. Methodology and Data Requirements

We adopted the Job Generation and Growth Decomposition Tool (JoGGs) of the World Bank to undertake an empirical investigation on how economic growth might dampen poverty through employment generation and productivity gains. The methodology intends to draw insights on how economic growth may be influenced by changes in employment, labour productivity, sectoral composition and shifts as well as the demographic transition. The methodology further accounts for the sources of labor productivity growth as originating from total factor productivity (TFP) growth, inter-sectoral shifts and changes in capital intensity.

To perform the decomposition we needed data on output (aggregate and by sectors), employment by sectors, population by ages, capital stock and the share of capital stock in total income for two periods and in our case we considered 2006–2011. Data on output, capital stock and the share of capital stock in income was obtained from the World Development Indicators (WDI) online facility of the World Bank. We shall measure growth by Value Added in order to ensure consistency with disaggregated sectoral data. Data on employment by sectors was obtained from Uganda National Household Panel Survey 2009/10. Data on population by ages was obtained from United Nations online Statistical Data base. All our monetary data are in constant dollars of 2000.

### 4. Findings and Their Discussion

#### 4.1 Economic Growth Profile, Productivity and Aggregate Employment

We sought to understand how economic growth profile in Uganda is linked to employment and productivity enhancement both at the sectoral and aggregate levels. As is conventionally known from standard economic theory, GDP per capita,  $\frac{\text{Total output}}{\text{Total population}} = q$  can be expressed as

$$\frac{\text{Total output}}{\text{Total population}} = \frac{\text{Total output}}{\text{Total Employment}} \frac{\text{Total Employment}}{\text{working age population}} \frac{\text{working age population}}{\text{Total population}} \quad (1)$$

Alternatively stated,

$$q = \beta * \lambda * a \quad (2)$$

Where,  $\beta$  is a measure of labor productivity/output per worker,  $\lambda$  is a measure of the employment rate and  $a$  is a parameter measuring the percentage of the population in the age net of active workers out of the entire population. We can also represent the summation of the growth in  $\beta$ ,  $\lambda$ , and  $a$  as the total change in output per person. Letting  $\bar{\beta}$ ,  $\bar{\lambda}$ , and  $\bar{\alpha}$  define the portion of the growth of the economy associated with the aforementioned contributors, the economic growth speed can be represented thus;

$$\frac{\Delta q}{q} = \bar{\beta} \frac{\Delta q}{q} + \bar{\lambda} \frac{\Delta q}{q} + \bar{\alpha} \frac{\Delta q}{q} \quad (3)$$

Consequently, the total growth can be expressed as,

$$\Delta q = \bar{\beta} * \Delta q + \bar{\lambda} * \Delta q + \bar{\alpha} * \Delta q \quad (4)$$

$\bar{\beta} * \Delta q$  is the component of the growth in output per capita contributed by labor productivity/ output per worker holding the employment rate  $\lambda$  and the percentage of people in the age net of workers  $\alpha$  constant. There are diverse possibilities in which any two items can remain constant; both components can remain constant at the level registered at the start year of the considered or they can remain constant at the level attained at the end year considered. Additionally, any of them can remain fixed at the start year value and the other remains fixed at the end year value. Other methodologies undertaking component decompositions consider only situations where both components remain fixed at the start or end years, thus generating an enormous residual. However, the Shapley decomposition, which we adopt in this study, considers all possibilities and controls for the relative significance of the different items which is contingent upon the several alternatives a particular component can remain fixed and hence doing away with the residual.

In the same vein,  $\bar{\lambda} * \Delta q$  is the component of the growth in output per capita originating from the contribution of the employment rate with the productivity parameter  $\beta$ , and the percent of people in the age net of workers out of the entire population  $\alpha$  held fixed. Finally,  $\bar{\alpha} * \Delta q$  is the component of the growth in output per capita originating from the contribution of the demographic changes with the first two components held constant.

In Table 1 we present a description of the variables employed during the decomposition exercise: For the period considered in this study (2006–2011), Uganda attained a 17% growth rate in per capita value added. This growth rate was supported by positive changes in labor productivity (22.37%) and positive changes in the demographics (0.41%). However, the growth rate was dampened by a fall in the employment rate (-5.41%). The results from this data description already points to a profile of growth that is jobless since the percentage of workers out of the population in the age net of workers reduced.

Table 1. Employment, output, productivity and population, Uganda 2006–2011

	2006	2011	% change
GDP (value added) (in Ugandan Shillings)	9,395,979, 621	12, 895,873,648	37.2
Total population	28,431,204	33,424,683	17.6
Total population of working age	13,438,875	15,935,601	18.6
Total number of employed	11,113,222	12,464,780	12.2
GDP (value added) per capita	330	386	16.74
Output per worker	845	1,035	22.37
Employment rate	82.69	78.22	-5.41
Share of population of working age	47.27	47.68	0.41

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

#### 4.1.1 Results and Interpretation

Equation (4) shows a decomposition of the aggregate per capita growth into labor productivity, employment rate and demographic transition component. The findings obtained by operationalizing equation (4) are reported in Table 2 and figure 1 below. Table 2 shows the absolute contribution as well as the percentage distribution of labor productivity, employment rate, and demographic transition to the registered growth in per capita output. The absolute figures in Table 2 and figure 1 are in US dollars of 2000.

Table 2. Overall economic growth by its contributors, Uganda 2006–2011

	2000 USD	Overall % Economic growth
Total Growth in per capita GDP (value added)	55.34	100
Growth originating from labor productivity	72.23	130.52
Growth originating from employment rate	-19.97	-36.09
Growth originating from demographic transition	3.08	5.57

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

From the table above, the change in the demographic transition contributed 6% of the change in GDP per capita. This implies that a change in the demographic transition contributed 6% to the total change in GDP per capita while holding other components constant. This further implies that the dependence ratio fell for the case of Uganda and this has a great bearing to increasing incomes per capita and poverty reduction. Changes in productivity or output per worker were the most instrumental in contributing to the growth in GDP per capita, it generated a 131% of the growth in per capita GDP. Conversely, there was a contraction in employment. The country experienced a decline in economic growth per person to the tune of 36% originating from a decrease in the employment. This implies that the growth profile in Uganda for the period 2006–2011 was a job-less growth. Figure 1 below represents how each component contributed to the growth in value added per capita, 2000 US dollars. It shows that the demographic change and productivity contributed USD 3.1 and 72.2 per capita, respectively. Yet, the employment rate contributed negatively USD 20 per capita.

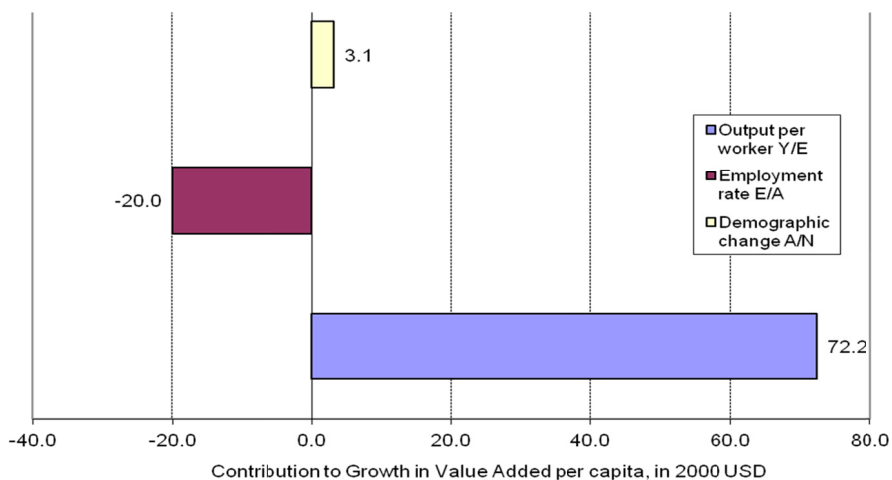


Figure 1. Aggregate employment, productivity, and demographic profile of growth Uganda 2006–2011

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

Having decomposed aggregate per capita growth we can go further and undertake a decomposition of its key components as follows: i) we seek to understand the contribution of the different sectors of the economy to the total change in the employment rate  $\lambda$  and ii) we move on to understand the factors responsible for changes in total labor productivity/ output per worker  $\beta$ ; the role played by the overall efficiency of the factors of production, stock of capital and the movement of labor across the sectors of the economy (between sector effect). We implemented the analysis at both aggregate and sectoral levels. In doing so we first undertake to decompose growth into employment and productivity at a macro-level and then undertake to decompose employment and productivity components into their respective sub-items. In figures 2a and 2b we present a decomposition of employment and labor productivity by sectors.

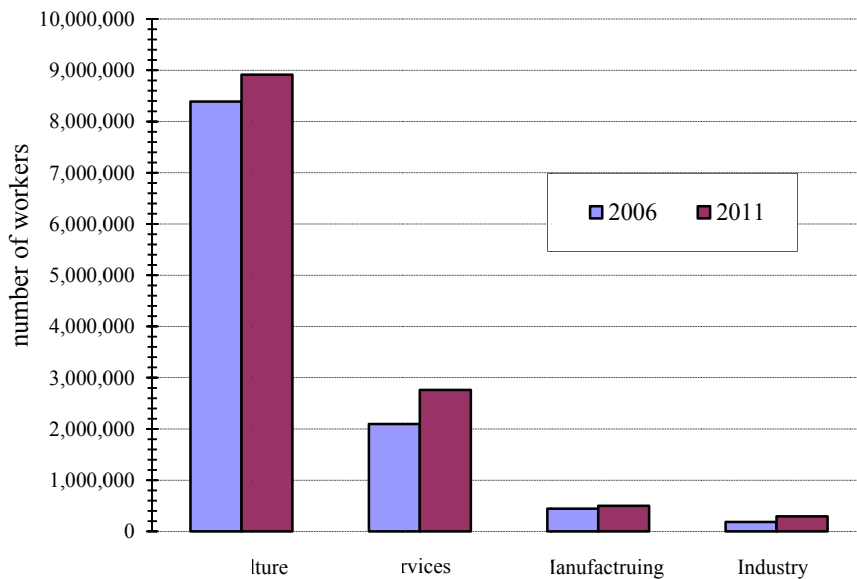


Figure 2a. Employment by sectors Uganda 2006–2011

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

Figure 2a shows that agriculture is the leading employer in Uganda employer well over 8 million Ugandans

(translating to over 70% of the entire labor force) in both periods. This is followed by the services sector that is employing over 2 million Ugandans (19% in 2006 and 22% in 2011). Both manufacturing and industry (comprises other components apart from manufacturing e.g. construction, mining and utilities etc.) employ well below 1 million Ugandan but manufacturing is doing better than the other industry. As expected, in terms of productivity, we observe the opposite in figure 2b. Agriculture has the lowest output per worker and industry has the highest in both 2006 and 2011. The industrial sector is followed by the services sector and manufacturing. This puts a policy question on the productivity of jobs held in the agricultural sector in terms of income that workers can generate. Lower productivity implies lower earnings for workers involved in that type of economic activity and, by extension, it implies low prospects of overcoming the problem of poverty by those employed in that sector. Agriculture being the major employer in Uganda, it implies that the majority of workers in Uganda are holder low paying jobs an issue which has a great bearing on poverty alleviation.

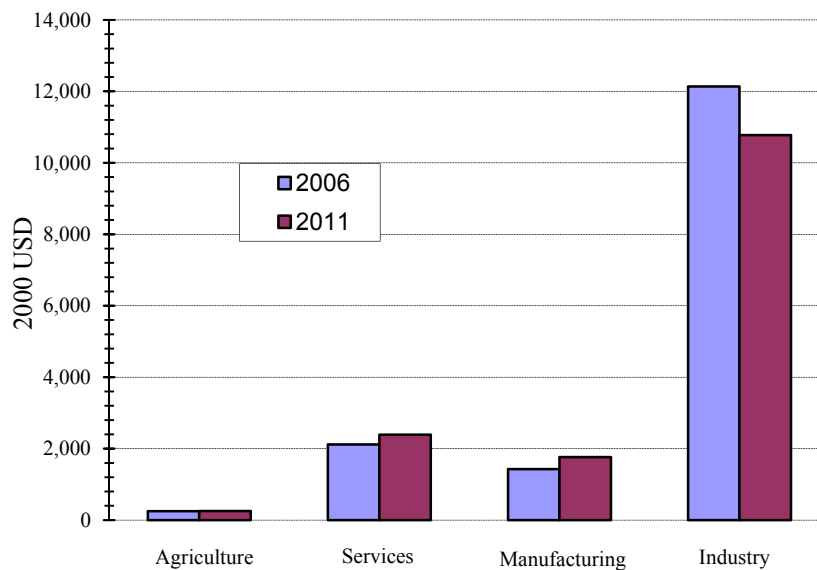


Figure 2b. Output per worker by sectors, Uganda 2006–2011

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

#### 4.2 Sectoral Composition of Employment

In order to vividly appreciate the role of sectors in availing job openings and in overall economic growth per person, a deeper decomposition of the employment growth rate ( $\Delta\lambda$ ) by sectors is implemented. This is implemented by expressing the total employment rate as the summation of the individual sector employment rates as follows:

$$\Delta\lambda = \sum_{i=1}^s \Delta\lambda_i \quad (5)$$

Where  $\Delta\lambda_i = \frac{\text{Change in Total Employment in sector } i}{\text{Working age population}}$  measures the growth in employment of a given sector

calculated as a percentage of the population in the age net of workers, hence indicating a sector that is more employment intensive.

Having known the sectoral contribution to the change in the employment rate, we can further undertake to explore the linkage existing between the employment rate in sector  $i$  and in economic growth per person. This is equivalent to tying together the results we observed in steps 1 and 2 above. Consequently, sector  $i$ 's total contribution can be derived by multiplying the portion going to overall employment generation and the portion

of the employment rate in the overall economic growth per person. The result is a component of GDP per capita growth originating from sector  $i$  while holding all other factors/components constant.

Table 3 represents the sectoral composition of employment. It is noteworthy that all sectors experienced an absolute increase in total employment, with the industrial sector leading followed by the services, manufacturing and agriculture came last. It is worth noting that only services and industry had positive changes in the employment rates. Figure 2a illustrates the same data. It can be observed that total employment grew by 12%, but this was counteracted by an instantaneous positive change in the population of the working age causing the employment rate to dampen by 5.41%.

Table 3. Sectoral composition of employment, Uganda 2006–2011

	Total employment			Employment/pop. of working age		
	2006	2011	% change	2006	2011	% change
Agriculture	8,389,075	8,913,741	6.25	62.42	55.94	-10.39
services	2,095,951	2,760,421	31.70	15.60	17.32	11.07
Manufacturing	444,565	498,418	12.11	3.31	3.13	-5.45
Industry	183,631	292,200	59.12	1.37	1.83	34.19
Total	11,113,222	12,464,780	12.16	82.69	78.22	-5.41

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

#### 4.2.1 Findings and Explanations

The findings relating to sectoral composition of employment in the economy are presented in figure 3a and table 4 a below. This enables us to tell a sector whose growth was jobless or job-creating. In so doing, the Table enables us to show how a contraction in the employment rate of -4.47 percentage points can be broken down according to the sectors of the economy. Agriculture is responsible for most of the decline and then the manufacturing sector. Agricultural sector contributed the most to the fall in the employment rate followed by the manufacturing sector. Agriculture and manufacturing sectors s contributed to the contraction in the percentage of the employed out of the population in the age net of workers by 6.5 and 0.2 percentage points respectively. Positive increments are noted in the services and industrial sector with 1.73 and 0.5 percentage points, respectively. In the same vein, Figure 3a distributes the decline in the employment rate of 4.47 percentage points amongst the different sectors. These results imply that growth in the agricultural and manufacturing sectors was jobless while growth in the services and industrial sectors was job generating. These findings combined with high productivity in services and industrial sectors give a great prospect to these sectors in an effort to reduce poverty via employment creation.

Table 4a. Sectoral decomposition of the employment rate changes, Uganda 2006–2011

	Growth in the percent of the employed	Sectoral composition of percent of the employed
Agriculture	-6.49	145.0
Services	1.73	-38.6
Manufacturing	-0.18	4.0
Industry	0.47	-10.4
Total employment rate	-4.47	100.0

Source: Numbers in 2000 USD. Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.



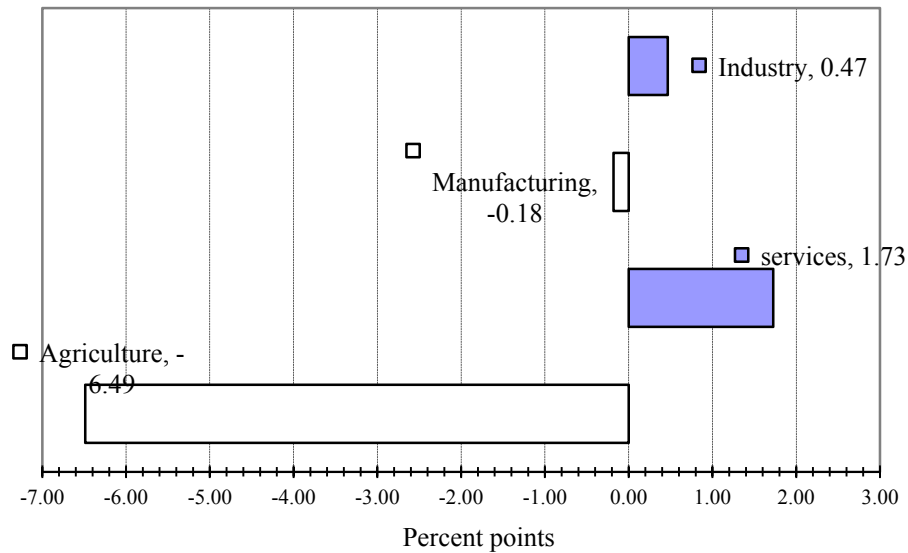


Figure 3a. Contribution of each sector to change in employment-to-population ratio Uganda 2006–2011

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

Tables 4b and Figure 3b, indicate a sectoral decomposition of employment changes to the total change in GDP per capita. It is worth noting that total per capita output filed a negative of 20 US dollars. Out of this agriculture and manufacturing contributed with -29 and -0.8 US dollars, respectively. Services and industry contributed positively 7.7 and 2.1 US dollars, respectively. Agriculture being the major sector in Uganda, a small contraction in employment led to a very big negative effect on growth such that the positive effect in services and industry could not offset it.

Table 4b. Employment growth and overall economic growth rate per person, Uganda 2006–2011

	Sectoral composition of economic growth per person (US\$)	Economic growth per person (%)
Agriculture	-29.0	-52.3
Services	7.7	13.9
Manufacturing	-0.8	-1.5
Industry	2.1	3.8
Total contribution	-20.0	-36.1

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

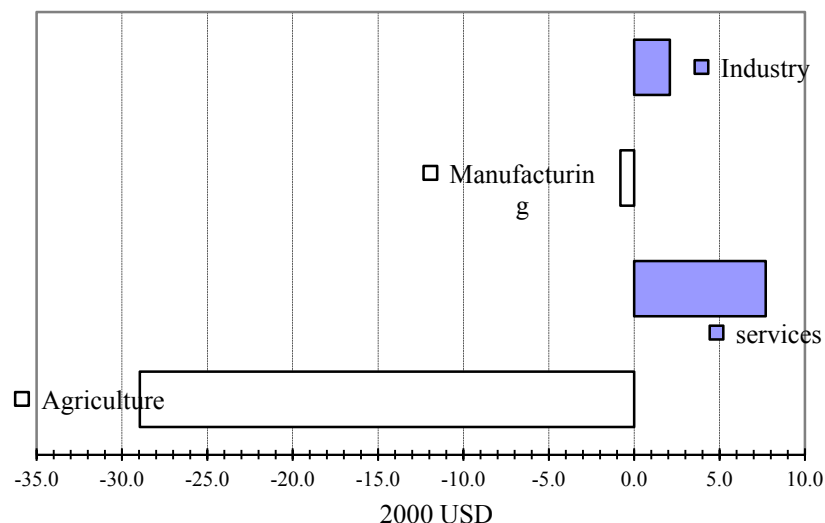


Figure 3b. Contribution of change in employment-to-population ratio to change in GDP (value added) per capita, by sector Uganda 2006–2011

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

#### 4.3 Sectoral Composition of Changes in Labor Productivity/Output Per Worker

We undertake to analyze the within sector changes in labor productivity as well as the sectoral employment shifts expressed as:

$$\frac{\text{Total output}}{\text{Total Employment}} = \sum_{\text{Sector}} \frac{\text{Output of sector}_i}{\text{Employment of sector}_i} \frac{\text{Employment of sector}_i}{\text{Total Employment}} \quad (6)$$

In this equation Total labor productivity is presented in terms of the relative labor productivity in each of the sectors of the economy. The relative significance is determined by the sectors participation in employment generation.

Employing the Shapley technique, total labor productivity is broken down into various components; labor productivity within sectors (the within component) and the relocation of workers between sectors (the between component). It is expected that an increase in labor productivity within a sector contributes to an overall increase in average labor productivity. However, the size of this effect hinges upon the relative participation of each sector in total employment. Alternatively, the movement of labor from one sector to another sector, generated by differences in the level of efficiency, contributes to an increase in average productivity if the movement of labor leads to a higher proportion of labor being employed in more efficient sectors.

If we succeed in decomposing the change in labor productivity into the within and between components, then it's possible to compute the change in total GDP per capita that originates from the growth in labor productivity in sector  $i$  as well as the inter-sectoral movement of labor. Under this analysis, the contribution of growth in labor productivity in a given sector can be linked to total economic growth per person when we hold all other components constant and attribute the total growth to only the growth in labor productivity in sector  $i$ . In the same vein, the impact of inter-sectoral shift can be looked at in a situation when all other components are kept constant and that the observed total growth originates from the relocation of workers across sectors.

Table 5 represents labor productivity for the two years considered in this study as the percent growth for the period. The industrial sector saw a sharp decline in the output per worker (11%) while the agricultural sector saw a small positive growth of 2% compared to manufacturing (24%) and services sector (13%).

Table 5. Sectoral composition of changes in labor productivity (US\$ and percent change), Uganda 2006–2011

	2006	2011	% change
Agriculture	249	254	1.84
services	2,118	2,392	12.94
Manufacturing	1,427	1,764	23.57
Industry	12,138	10,775	-11.23
Total output per worker	845	1,035	22.37

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

Table 6a and Figure 4a below present the findings generated by applying equation 6 above to Ugandan data. Column 1 of Table 6a indicates the sectoral contributions and the movement of labor across sectors in total economic growth per person. The \$189.1 increase in labor productivity can be attributed to \$27 decrease registered in the industrial sector and an increase in Agriculture (\$3.4), Services (\$56.2), Manufacturing (\$13.5) and inter-sectoral movement of workers of \$143.3. The observed positive contribution of the inter-sectoral shift component implies that, on average, labor relocated from less efficient to more efficient sectors of the economy. We noted in the previous section that all sectors increased their employment shares, but agriculture had the lowest share of 6.3%. It is therefore possible to attribute the growth in labor productivity to the relocation of workers into other sectors and to a small extent into agriculture.

Column 2 of Table 6a presents findings of the labor productivity rate of change. Various sectors contributed differently to the totality of change in labor productivity; agriculture (2%), services (30%), manufacturing (7%) and the inter-sectoral shift (76%). The industrial sector accounted for a decline of 14.4%. Consequently, Agriculture, Manufacturing and Services, all realized positive effects in labour productivity and this coupled with their big contribution to total employment means that they had had significant positive effects on total labor productivity. Conversely, the industrial sector contributed negatively to the average labor productivity. Inter-sectoral shifts, which measures the relocation of workers across sectors contributed positively to the average labour productivity. This implies that labor relocated from less efficient to more efficient sectors.

Table 6a. Labor productivity; within and between sector effects, Uganda 2006–2011

	Change in overall labor productivity (US\$)	Change in overall labor productivity (%)
Agriculture	3.4	1.8
services	56.2	29.7
Manufacturing	13.5	7.1
Industry	-27.2	-14.4
Inter-sectoral shift	143.3	75.8
Over growth in labor productivity	189.1	100.0

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

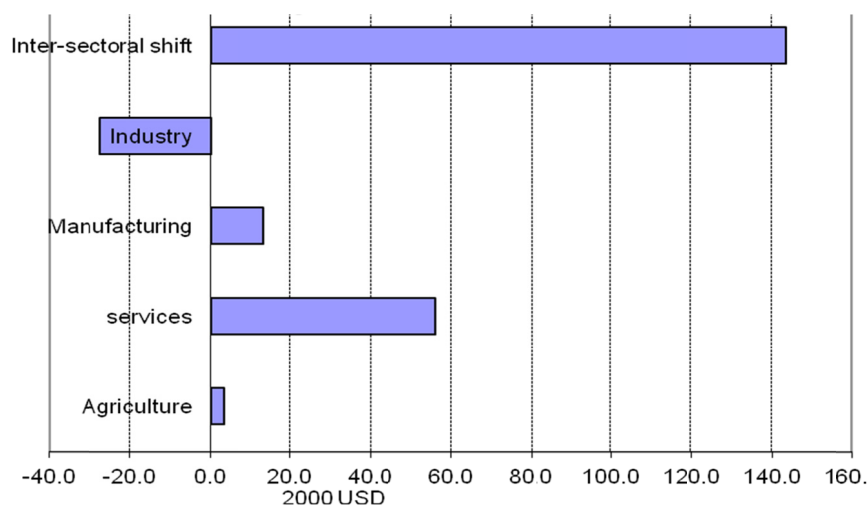


Figure 4a. Decomposition of growth in output per worker: inter-sectoral shifts and within sectoral output growth Uganda 2006–2011

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

Table 6b and Figure 4b present how the growth in labor productivity and the movement of labor across sectors impact on overall economic growth per person.

Table 6b. Economic growth per person: the contribution of the within Sector growth in Labor productivity and Inter-sectoral Shifts, Uganda 2006–2011

	Sectoral composition of economic growth per person (US\$)	Sectoral composition of economic growth (%)
Agriculture	1.3	2.3
services	21.5	38.8
Manufacturing	5.1	9.3
Industry	-10.4	-18.8
Inter-sectoral shift	54.7	98.9
Total contribution to the growth in GDP per capita	72.2	130.5

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

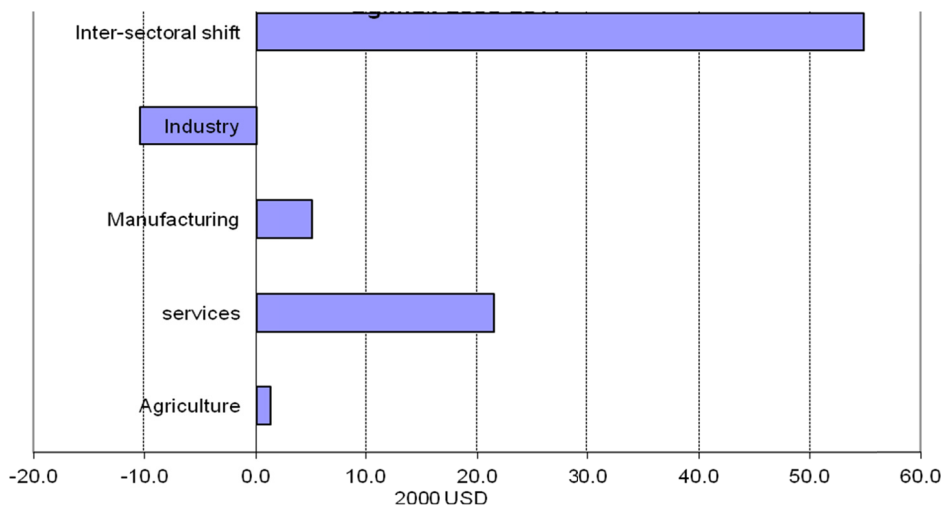


Figure 4b. Contribution of within sector output per worker changes and inter-sectoral shifts to change in GDP (value added) per capital Uganda 2006–2011

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

#### 4.4 Sources of Growth in Total Labor Productivity

Under this analysis we explore three sources of growth in labor productivity: i) Expansion in capital intensity ii) Improvement in overall factor efficiency and iii) movement of workers from less efficient to high efficient sectors of economy.

To capture these effects, we consider a production function that exhibits constant returns to scale, if  $Q_t = \xi_t f(L_t, K_t)$  where  $K_t$  is the capital stock and  $\xi_t$  a multiplicative shift parameter such that labor productivity can be given by  $Q_t / L_t = \xi_t f(1, K_t / L_t)$ . Consequently, labor productivity will be explained by changes in the capital intensity  $K_t / L_t$ , and changes in the shift parameter  $\xi_t$ . The main function of the shift parameter term in this case is to account for all others factors influencing growth apart from the capital intensity, prominently known as the Solow residual. This term is expected to captures such aspects as technological progress and the movement of workers away from inefficient to more efficient sectors, also known as the inter-sectoral shift term. Additionally, this term might also capture a component of the business cycle. For example, during an economic depression, many firms might operate at an excess capacity; however, during the recovery and the peak times, this might be interpreted as a growth in labor productivity. At this stage, it therefore possible to break down the within productivity growth into the growth in capital intensity and the residual which is commonly referred to as the Total Factor Productivity (TFP) growth.

Assuming a conventional Cobb-Douglas production function, there is a possibility to untie the effect of the growth in capital intensity from others:

$$\frac{Q}{L} = \theta \left( \frac{K}{L} \right)^{1-\sigma} \tag{7}$$

As in standard micro theory, assuming a competitive market situation  $1 - \sigma$  is the return to capital as a percentage of overall growth. A computed value of  $\sigma$  enables us to compute the TFP as a residual: In period zero (0), it can be expressed as follows:

$$\left( \frac{Q}{L} \right)_{t=0} / \left( \frac{K}{L} \right)_{t=0}^{(1-\sigma)} = TFP_{t=0}. \tag{8}$$

In period one (1) it is prudent to factor in that component of the growth in labor productivity originating from the movement of workers across sectors;

$$\left[ \left( \frac{Q}{L} \right)_{t=1} - \Delta\beta_B \right] / \left( \frac{K}{L} \right)_{t=1}^{(1-\sigma)} = TFP_{t=1} \quad (9)$$

The first term presented in the bigger parentheses simply point to labor productivity in period one (1) that is net of the movement of labor across sectors. This enables to draw insights on whether the growth in labor productivity net the movement of workers across sectors was due to the growth in capital intensity or in TFP (net of relocation effects). Having identified the components of growth in labor productivity into TFP and capital intensity, this gives us the possibility to understand how every single one of them influences economic growth per person. In Table 7 we present a description of the data that we employed during this analysis.

Table 7. Capital stock, share of capital in total income, labor productivity, capital intensity, Uganda 2006–2011

	2006	2011	% change
Share of Capital in Total Income (%)	21%	21%	0.00
Capital	2,250,759,969	3,073,422,546	36.55
Overall labor productivity	845	1,035	22.37
Labor productivity net of between sector effect	845	891	5.41
Capital intensity	203	247	21.74
TFP residual net of inter-sectoral shifts	278	232	-16.51

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

#### 4.4.1 Findings

In Figure 5 below, we present the different components of the growth in aggregate labor productivity for Uganda for the period under review, 2006 to 2011. This figure shows the importance of capital intensity and TFP originating from the above equations, as well as the between sector effect that was obtained previously.

At an aggregate level, labor productivity grew by 22.37 percent (Table 7). Decomposing this growth, it clear that the inter-sectoral employment shifts positively impacted the total labor productivity with \$143.3. In the same vein, capital labor ratio had a positive influence by contributing an additional \$204. Unfortunately, TFP contributed negatively to the total labor productivity by \$158; however, this did not offset the positive effects (Figure 5). Consequently, it becomes right for one to argue that TFP changes were responsible for lower total labor productivity. As a result it becomes very interesting to investigate the factors responsible for a decrease in TFP.

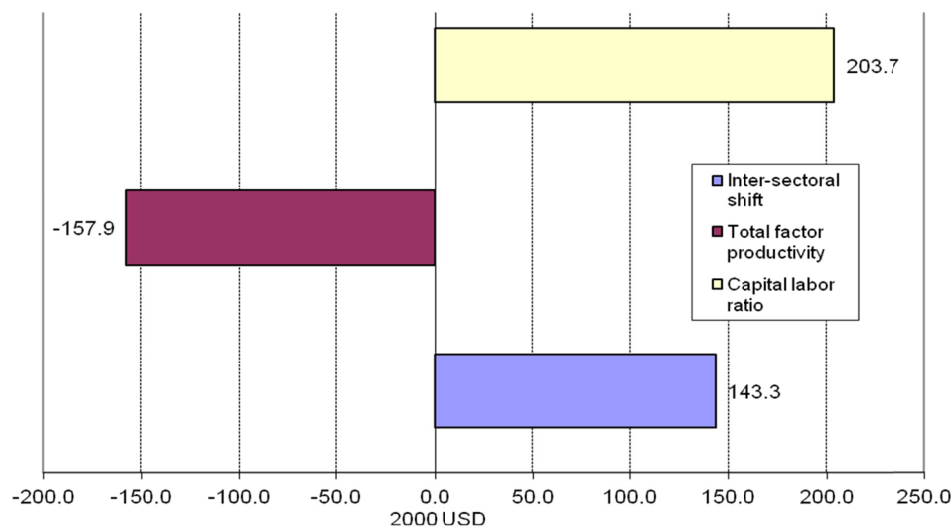


Figure 5. Decomposition of changes in output per worker Uganda 2006–2011

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

#### 4.5 Exploring the Importance of Worker Movements Across Sectors

Under this section, we attempt to explore how changes in the employment intensity in each sector can offer an explanation for the importance of labor movements across sectors to economic growth per person or labor productivity growth. Deeper insights can be drawn on how the relative participation of different sectors in employment provision offers an explanation of the importance of worker migration across sectors to economic growth per person or to labor productivity. It is commonly known that an increase in the employment intensity in more efficient sectors contributes to an increase in overall productivity and as such contributes to the movement of workers across sectors of the economy. Alternatively, the relocation of workers away from more efficient sectors will dampen the labor efficiency and hence impact negatively the component of the movement of labor across sectors. Similarly, an increase in the employment intensity in less productive sectors negatively impacts growth and vice versa. The size of these effects depends on two important factors; i) a sector's efficiency relative to the average efficiency and ii) size of the component of the movement of labor across sectors. If we compute the effect of each sector to the total growth in labor productivity linked to movement of labor across sectors, it becomes possible for us to compute the GDP per capita growth that is specifically originating to the relocation of labor in each sector.

##### 4.5.1 Findings

In Table 8 we present the findings of implementing the analytical steps mentioned above. In column one (1) we observe the average labor productivity between 2006 and 2011 and the mean labor efficiency for the whole economy in the respective last row. In column two (2) we observe the sectoral composition of employment. Column three (3) indicates the sectoral composition of the \$143.3 component of the movement of labor across sectors as associated with overall labor productivity. Employment intensity in agriculture is negative and agriculture being a low productivity sector, contributed positively to the inter-sectoral shift component. The change in employment intensity in services and industry is positive and these sectors being high productivity sectors, they contributed positively to the inter-sectoral shift component. The change in the employment share in the manufacturing sector was neutral and hence had a minor negative contribution to the inter-sectoral shift component. Of the three positively contributing sectors, agriculture had the lowest contribution because it's a low productivity sector while industry and services are high productivity sectors and hence contributed most to the inter-sectoral shift component. Hence, movements of labor to industry and services sectors are associated with increases in per capita growth or productivity growth.

Table 8. Exploring the importance of the worker movements across sectors. Uganda 2006–2011

	Mean labor productivity	Growth in sectoral employment intensity (%)	Sectoral composition of the movement of labor
Agriculture	252	-0.040	27.37
services	2,255	0.033	43.22
Manufacturing	1,595	0.000	-0.01
Industry	11,457	0.007	72.76
Aggregate	940		143.33

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

In Table 9 we present the sectoral composition of the movement of workers as well as the direction of change of the effect. Whereas agricultural had a negative employment share shift, it contributed positively (by 19%) to inter-sectoral shifts due to the fact that it's a low productivity sector and hence any shifts of workers from this sector positively influences per capita growth. Services and industry had a positive employment share and being high productivity sectors, contributed positively (by 30% and 51%, respectively) to inter-sectoral shifts. Hence any shift of labor to these sectors positively influences per capita growth. Manufacturing had a negative employment shift share and being a high productivity sector, contributed negatively (by 0.01%) to inter-sectoral shifts. This implies that shifts of labour from the manufacturing sector somewhat hurts per capital growth.

Table 9. Sectoral composition of the movement of workers across sectors. Uganda 2006–2011

	Sign of the effect of the worker movements	Sectoral composition of the movement of workers (percent)
Sectoral contributions		
Agriculture	-	19.09
services	+	30.15
Manufacturing	-	-0.01
Industry	+	50.76
Overall sectoral composition of worker movements		100

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

#### 4.6 All Steps Together

Having successfully gone through all the aforementioned steps of this analysis, it is now possible to compute the contribution of each of the sectors of the economy to the overall growth in total output per capita. In Tables 10a and 10b we present the findings of this exercise for the case of Uganda, in percentage terms and in US dollars of 2000, respectively. Components contributed variously to the percentage change in GDP per capita. Table 10a shows that 6% of the economic growth per person can be attributed to the demographic component. Efficiency of labor within sectors and the relocation of labor across sectors contributed positively by 32% and 99%, respectively. This implies that labor moved from less efficient to more efficient sectors of the Ugandan economy. However, the employment rate contributed negatively by 36% implying a reduction in the number of people with working age that were employed. Hence, one can argue that Uganda's growth profile for the period 2006–2011 was jobless. Considering the sectors of the economy, a more significant role was played by the services sector (83%), industrial sector (35%) and manufacturing sector (8%). Agriculture contributed negatively by 31%.

Table 10a. Components contributing to overall GDP per capita growth, Uganda 2006–2011

	Sectoral composition of labor productivity (percent)	Sectoral composition of worker absorption (percent)	Sectoral composition of the movement of workers (percent)	Overall (percent)
Sectoral contributions				
Agriculture	2.32	-52.33	18.89	-31.12
services	38.79	13.92	29.83	82.54
Manufacturing	9.28	-1.45	-0.01	7.82
Industry	-18.80	3.77	50.22	35.18
Subtotals	31.60	-36.09	98.92	94.43
Demographic component	-	-		5.57
Overall (percent)				100
Overall growth in GDP per person 2006–2011				16.74

Source: Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

Despite the positive output per worker contribution of the agricultural sector, it experienced such a significant decline in the employment rate which dampened the positive contribution originating from labor productivity growth. Even, the positive effect of shifts of labor away from agriculture to other sectors could not offset this effect, so that in the aggregate agriculture reduced total per capita growth by 31%. The services sector had all its contribution positive; contributed 39% to output per worker, 14% to the growth in employment, 30% to the inter-sectoral shifts and overall contributed 83% to total per capital growth. The industrial sector, however, registered a negative contribution to output per worker by 19%, but contributed positively and strongly via inter-sectoral shifts by 50% and a positive but modest contribution to the employment rate by 4% leading to an overall contribution of per capita growth of 35%. The manufacturing sector contributed positively only to output per worker by 9% but contributed negatively by 1.5% and 0.1% to employment rate and inter-sectoral shifts respectively. However, the positive effects more than offset the negative contribution leading to an overall



positive contribution of 8% to overall growth in GDP per capita.

Table 10b. Components contributing to overall GDP per capita growth, Uganda 2006–2011.

	Contribution of within sector changes in output per worker	Contribution of changes in Employment	Contributions of Inter-sectoral Shifts	Total
<b>Sectoral contributions</b>				
Agriculture	1.29	-28.96	10.45	-17.22
services	21.47	7.70	16.51	45.68
Manufacturing	5.14	-0.80	0.00	4.33
Industry	-10.41	2.09	27.79	19.47
Subtotals	17.48	-19.97	54.74	52.25
Demographic component	-	-		3.08
Overall growth in GDP per person				55.34

Source: Numbers in the table in US\$ of 2000. Analysis of data from World Development Indicators, National Household Panel Survey (2009/10) and United Nations Statistical Data Base.

## 5. Conclusions and Implications

This paper set out to establish the link economic growth and employment in Uganda for the period 2006–2011. We obtained data from World Development Indicators, Uganda National Household Panel Survey (2011) and United Nations Statistical Data Base and we adopted the Job Generation and Decomposition (JoGGs) Tool of the World Bank during the analysis. Our findings reveal interesting insights into the link. The growth profile of Uganda for the period 2006–2011 was jobless as evidenced by 36% change in per capita value added emerging from a decrease in the employment rate. Agricultural sector contributed the most to the decline in the percent of total change in capita GDP and in the employment rate by 31% and 6.5%, respectively. Manufacturing sector contributed positively to the overall growth in GDP per capita 8% but negatively to change in total employment rate by 0.2%. Positive contributions to the employment rate and growth in per capita GDP were observed in the services and industrial sectors. The services sector contributed 83% and 1.7% to the percent of overall change in the growth in economic growth per person and in the employment rate, respectively. The industrial sector contributed 35% and 0.5% to the percent of economic growth per person and in the employment rate, respectively. Therefore, by sectors, the growth profile in agriculture and manufacturing was jobless while the growth profile in services and industry was job-creating. It is further noted that productivity or output per worker contributed over 100% to total change in per capita GDP growth. By sectors, agriculture had the lowest labor productivity and the highest was in the industrial sector followed by the services sector. Hence the industrial and services sectors have higher prospects in an effort by the country to alleviate poverty via employment creation.

The inter-sectoral shifts had a positive contribution to the output per worker meaning that, there was a relocation of workers away from less efficient to more efficient sectors of the economy. All sectors, apart from manufacturing, contributed positively to the inter-sectoral shift component. Given that the employment rate in agriculture was negative and that it is a low productivity sector implies that the relocation of workers from agriculture to other sectors must have impacted capita growth positively via the between sector shift component. Conversely, the employment rate in the services and industry was positive and that they are high productivity sectors means that the relocation of workers to these sectors had a positive effect on the economic growth per person via the inter-sectoral shift component. The change in the employment rate in manufacturing was zero and that this sector having the lowest productivity after agriculture, means that the relocation of workers to this sector had a negative but modest effect on per capita growth via the inter-sectoral shift component.

The key messages from our analysis are: First, the results show the importance of the Services sector with a positive and strong effect on the output per worker, employment rate, and inter-sectoral shifts and hence on the overall per capita value added growth. Second, despite the positive labor productivity and the between sector shifts contribution of the agricultural sector, the decrease in its employment rate significantly dampened the positive effects so that in the aggregate agriculture reduced total per capita growth. Third, the industrial sector contributed negatively to output per worker but contributed positively and strongly via inter-sectoral shifts and positively but modestly via the employment rate leading to an overall positive contribution to per capita growth. Fourth, the manufacturing sector contributed positively only to output per worker by 9% but contributed

negatively to employment rate and inter-sectoral shifts respectively. However, the positive effects more than offset the negative contribution leading to an overall positive contribution to overall per capital growth. Fifth, there are positive effects associated with Uganda's demographic transition as the dependence ratio appears to have declined. There is therefore an opportunity to increase capita incomes and reduce poverty if adults get involved in economically productive ventures/jobs. Overall, the promising sectors for poverty reduction through productivity and employment generation in Uganda by order of importance; services sector, industrial sector and manufacturing. However, needless to mention is the fact that agriculture is the backbone; it is the major employer in the country (employing almost 70% of the labor force according the UNHS 2009/10). This notwithstanding, it is a low productivity sector yielding very low returns to its participants and hence having limited ability to alleviate poverty.

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