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**RWANDA**  
**Employment and Jobs Study**

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Africa Region



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## ABBREVIATIONS AND ACRONYMS

CIP	Crop Intensification Program
EDPRS	Economic Development and Poverty Reduction Strategy
EC	Establishment Census
EICV	Household Living Conditions Survey
GDP	Gross Domestic Product
GoR	Government of Rwanda
ILO	International Labor Organization
NISR	National Institute of Statistics of Rwanda
PHC	Population and Housing Census
PPP	Purchasing Power Parity
PRSP	Poverty Reduction Strategy Paper
RWF	Rwanda Francs
RIF	Recentered Influence Functions
USD	United States Dollars
WDI	World Development Indicators

Vice President:	Makhtar Diop
Senior Director:	Ana Revenga
Country Director:	Diarietou Gaye
Country Manager:	Carolyn Turk
Practice Manager:	Pablo Fajnzylber
Task Team Leader:	Tom Bundervoet



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## Executive Summary

**Fast growth in Rwanda since the turn of the century has been accompanied by solid poverty reduction.** Between 2000 and 2013, GDP grew at eight percent per year, resulting in a 170 percent increase in real GDP. Factoring in population growth, GDP per capita almost doubled. Growth was accompanied by solid poverty reduction, from 59 percent in 2000 to 57 percent in 2005 and 45 percent in 2010. As the poor almost uniquely depend on labor to generate income, the strong reduction in poverty suggests tangible improvements in employment outcomes over this period.

**This jobs and employment study focuses on the recent dynamics in Rwanda's jobs' landscape.** Using data from a variety of sources, mainly the three Integrated Households Living Conditions Surveys (EICV1, EICV2 and EICV3) and the 2011 Establishment Census, the report looks at what workers in Rwanda are doing and what they are making, and how this has changed over the past ten to fifteen years. Most of the report focuses on the five years between 2006 and 2011, although at times, we will also look at the evolution since 2001. The report concludes with a number of ideas to address Rwanda's jobs challenge in the near future.

### 1. A Snapshot of employment

#### *Agriculture and informality define Rwanda's jobs landscape*

**As in many low-income countries, unemployment in Rwanda is low.** In 2011, about two percent of the labor force was unemployed, in the sense that they were available for work and actively looking for employment. Underemployment however is rampant: The median worker worked less than 26 hours per week in 2011 (in all jobs), despite almost two-thirds of workers having several jobs. The rate of time-related underemployment was 36 percent, meaning that 36 percent of workers work less than 35 hours a week but would like to work more.

**Despite positive trends (see next section), employment in Rwanda remains characterized by agriculture, informality and low earnings.** In 2011, about 70 percent of workers had their main job in agriculture, with the remaining 30 percent engaging in a myriad of nonfarm activities<sup>1</sup>. Farm self-employment, people working on their own on their family's farm, accounts for almost 60 percent of employment, followed by farm wage employment (12 percent – see Figure 1). In the non-farm sector, self-employment in small enterprises dominates, closely followed by wage employment in the informal sector. The private formal sector provides employment to four percent of working Rwandans, while the public sector absorbs three percent of workers (Figure 1). Taken together, the modern wage sector accounts for seven percent of total employment.

**For the majority of the population earnings are low (though-as argued later-they have increased substantially in recent years).** In 2011, median monthly earnings from all jobs amounted to Rwf 18,175 (in 2011 prices), meaning that half of workers earn Rwf 18,175 per month or less (this amounted to \$31 using the official exchange rate and \$54 using the purchasing power parity-adjusted exchange rate)<sup>2</sup>. Half of workers earned between Rwf 9,400 and Rwf 33,300 per month<sup>3</sup>, and 90 percent of workers earn less than Rwf 65,000 per month - Figure 2. Less than six percent of employed Rwandans earned Rwf 100,000 per month or more (approximately \$300 in

<sup>1</sup> Main job is defined as the job where the worker spends most of his/her time.

<sup>2</sup> Average official exchange rate in 2011: \$ 1=Rwf 590.3. PPP exchange rate: \$1=Rwf 336.3 (WDI, 2014).

<sup>3</sup> This is the so-called interquartile range.

PPP terms). One third of workers are engaged in so-called low-earning jobs, meaning that their labor earnings are lower than the national poverty line.

**Figure 1: Agriculture dominates employment**

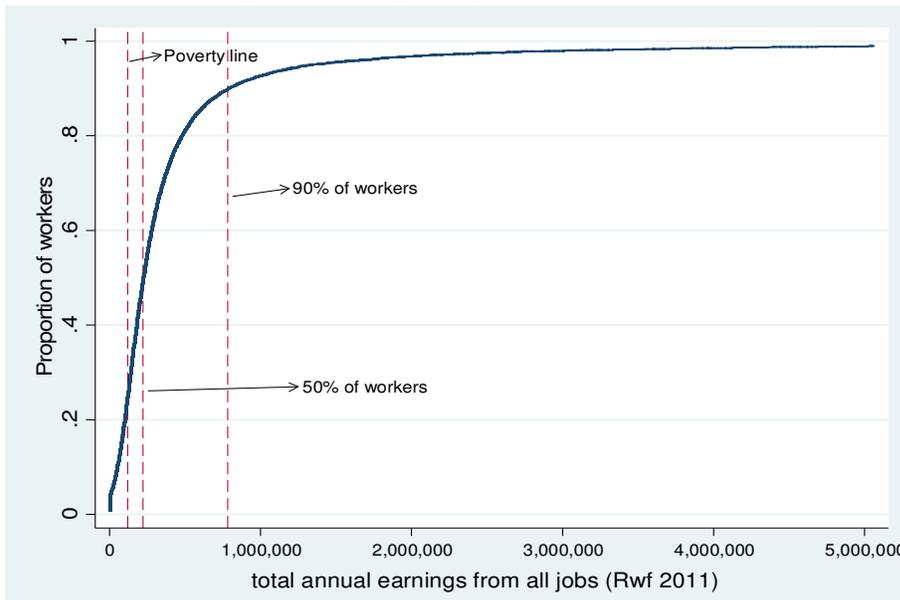
(Number of workers and employment share by employment type, 2011)



Source: EICV, 2011. World Bank staff calculations

**Figure 2: Earnings are low for most workers**

(Cumulative distribution of annual earnings, 2011)

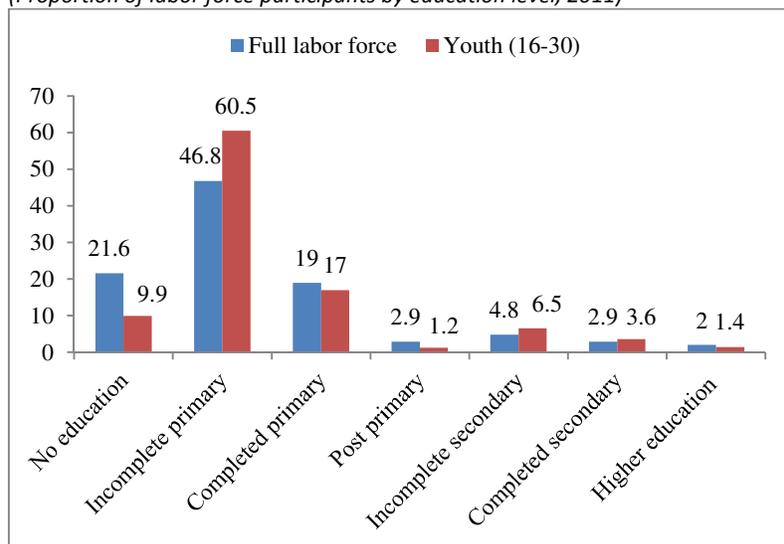


Source: EICV, 2011. Figure is censored at the 99<sup>th</sup> percentile and does not show top incomes. Negative earnings have been dropped.

**Low earnings reflect in large part the unskilled nature of the labor force.** In 2011, almost 70 percent of the labor force did not complete primary education, and only five percent completed secondary or more (Figure 3). Younger workers are increasingly being better educated, reflected by the lower proportion that never went to school and the higher proportions that are progressing towards incomplete secondary and beyond. The figures for the youth are underestimated, as 29 percent of youth were still in school at the time of the 2011 survey. In any case, the labor force will remain relatively low-skilled in the near future.

**Figure 3: The labor force is largely unskilled**

*(Proportion of labor force participants by education level, 2011)*



Source: EICV; 2011.

### *Firms are small and informal and account for a small share of overall employment*

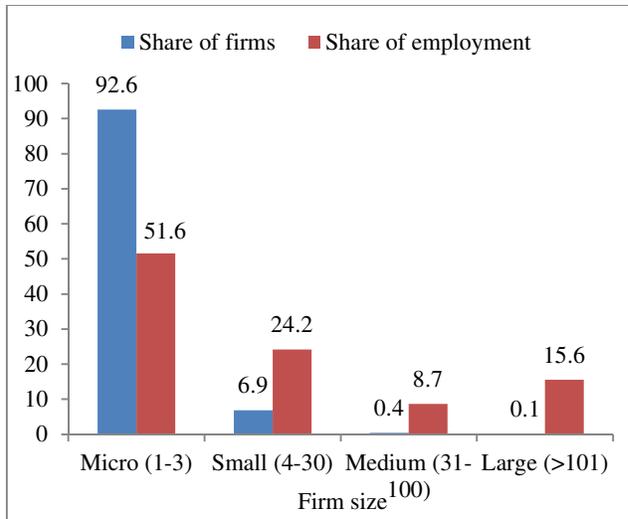
**Given the dominance of agriculture, only a small fraction of Rwanda’s workforce is employed in formal or informal business establishments.** The 2011 Establishment Census enumerated 128,000 businesses, providing employment to 280,000 workers, only six percent of Rwanda’s workforce. Indeed, most establishments are micro, often employing only a single person, and medium and large firms account for a mere 0.5 percent of establishments (Figure 4). Medium and large firms are however important in terms of employment, accounting for over 24 percent of employment in establishments (Figure 4). Micro-firms, although they make up more than 90 percent of firms in Rwanda, provide employment to about half of establishment workers. Almost 95 percent of firms are informal, accounting for 71 percent of employment in establishments (Figure 5).

**Figure 4: Micro-firms dominate, but seven percent of firms account for almost half of employment**

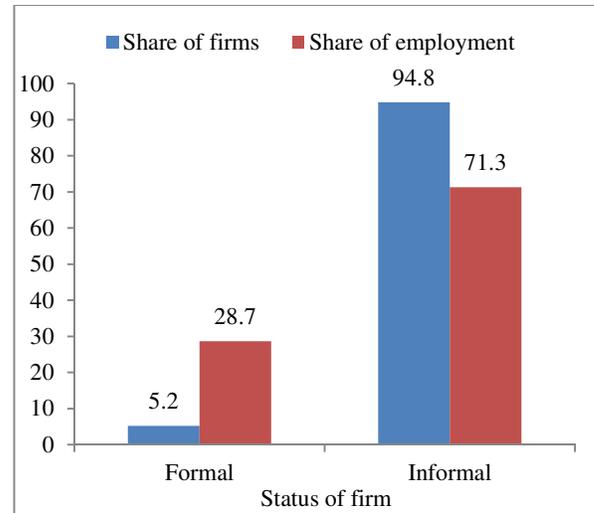
*(Number of firms by number of workers)*

**Figure 5: 95 percent of establishments are informal**

*(Sectoral share of employment, 2006-2011-2020 (projected))*



Source: EC, 2011; World Bank staff estimates and calculations

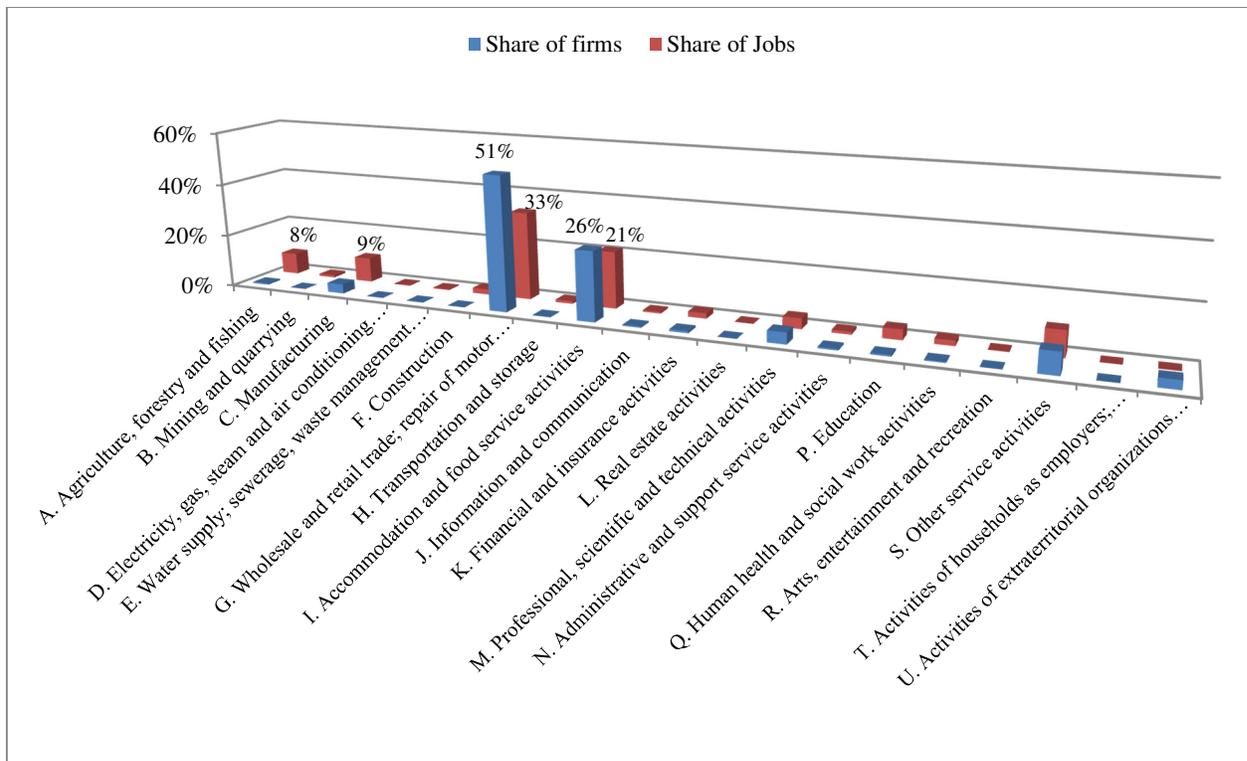


Source: EC, 2011, World Bank staff estimates and calculations

**Services dominate both firms and jobs, and most of these are in wholesale and retail trade and in hotels, restaurant and bars.** Over half of firms (51 percent) are in wholesale or retail trade. Services account for a higher share of establishments than jobs, owing to the small size of service establishments (Figure 6). Agriculture and manufacturing make up a significant share of jobs in establishments (17 percent), despite only accounting for 5 percent (manufacturing 4 percent) of firms. Almost one third of all jobs in agriculture and manufacturing (and half of the jobs in medium and large establishments in these two sectors) are in the Western Province, in coffee and tea growing cooperatives and in factories.

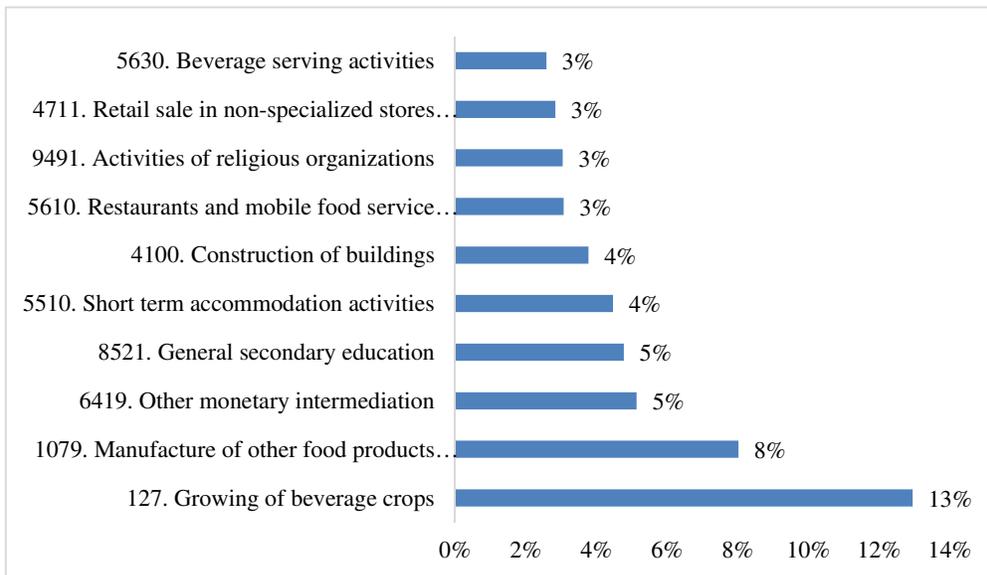
**Within the small formal sector, the most important sectors for waged jobs are retail and wholesale trade, manufacturing and agriculture (ignoring health and education services).** Retail and wholesale trade and hotels and restaurants account for the bulk of permanent employment in the formal sector, while tradables (agriculture and manufacturing) and construction tend to provide temporary employment. At the 4-digit product level, just ten products account for half of employment in formal established firms (Figure 7). Growing of beverage crops (tea and coffee), at 13 percent of jobs in formal establishments, is easily the most important formal job-creating activity, followed by “manufacturing of other food products” which includes tea and coffee processing (8 percent).

**Figure 6: Wholesale and retail trade and hotels and restaurants account for bulk of firms and jobs**  
(Sectoral distribution of firms and jobs)



Source: Establishment Census, 2011.

**Figure 7: Coffee and tea provide most employment in formal-sector establishments**  
*(Employment share of top 10 products in formal establishments)*



Source: Establishment Census, 2011.

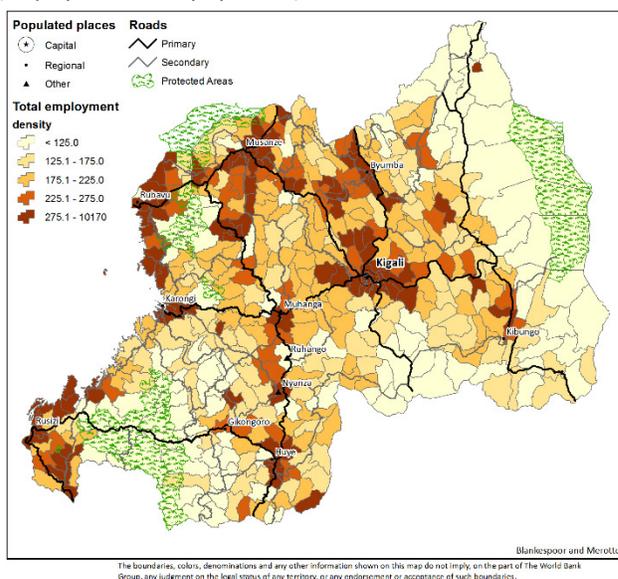
*Firms tend to be located in urban areas, along main roads, and in the Western Province*

**Jobs in establishments in Rwanda are concentrated around the main urban agglomerations and in the Western province.** Employment density is highest in the sectors in Kigali, Rubavu, Musanze and Rusizi, and, to a lesser extent, Byumba, Huye and Muhanga (Figure 8). Employment,

especially in services, is clearly concentrated along the main national roads: the further away from a national road, the lower the employment density. Employment in establishments is also relatively dense in the Western Province along the shoreline of Lake Kivu, owing to the overrepresentation of firms producing tradables: The Western Province accounts for 24 percent of population and 22 percent of all jobs in establishment, but for 36 percent of jobs in tradables.

**Figure 8: Employment in establishments is concentrated in the main urban centers and along the main roads**

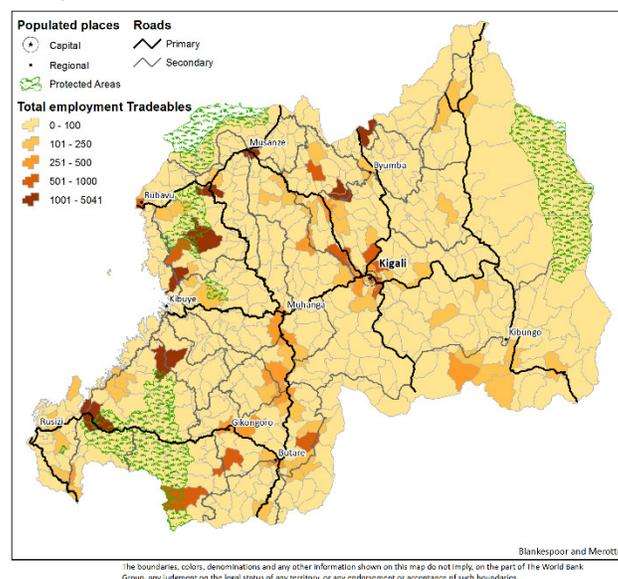
*(Employment density by sector)*



Source: Establishment Census, 2011

**Figure 9: Employment in tradables is mostly in the Western Province**

*(Total number of jobs in establishments producing tradables, by sector)*



Source: Establishment Census, 2011

## 2. The recent jobs dynamics: Firmly positive

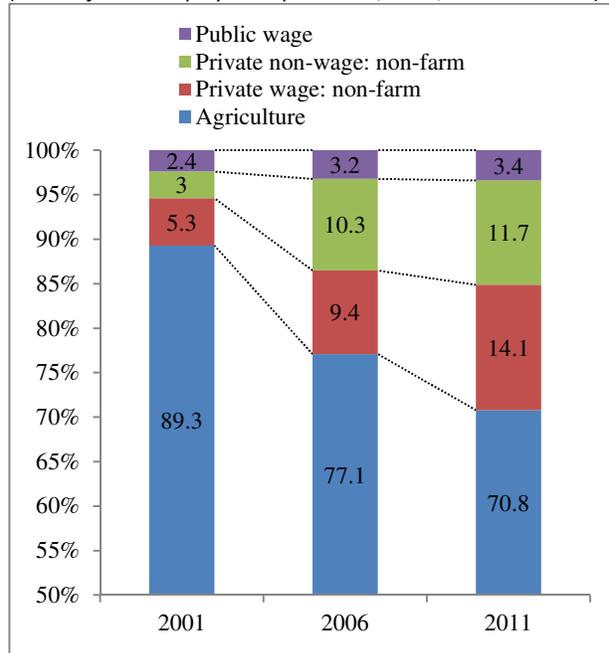
### *A move towards nonfarm employment and agricultural wage employment, driven by the youth*

The recent employment trends have been firmly positive. Workers have increasingly diversified their jobs portfolio by taking up employment in more productive sectors, earnings have increased substantially from a low base, more foreign and formal firms are being established and, related, employment in the formal private sector has doubled from a low base (between 2006 and 2011). Moreover, increases in labor productivity have been the driving force behind the increase in GDP per capita, explaining over 90 percent of per capita GDP growth between 2006 and 2011.

The move towards nonfarm occupations has been one of the most salient evolutions in Rwanda's jobs landscape. In 2011, 30 percent of employed Rwandans had their main job outside agriculture, up from 23 percent in 2006 (and 11 percent in 2001 - Figure 10). The move towards non-farm occupations as main employment understates the true extent of the shift: Considering all jobs, regardless of whether it is the primary or secondary occupation, the share of workers with an occupation outside agriculture increased from 30 percent in 2006 to 45 percent in 2011 (Figure 11). Farmers are increasingly taking up non-agricultural secondary jobs next to their main occupation on the land.

**Figure 10: Agriculture is losing employment share**

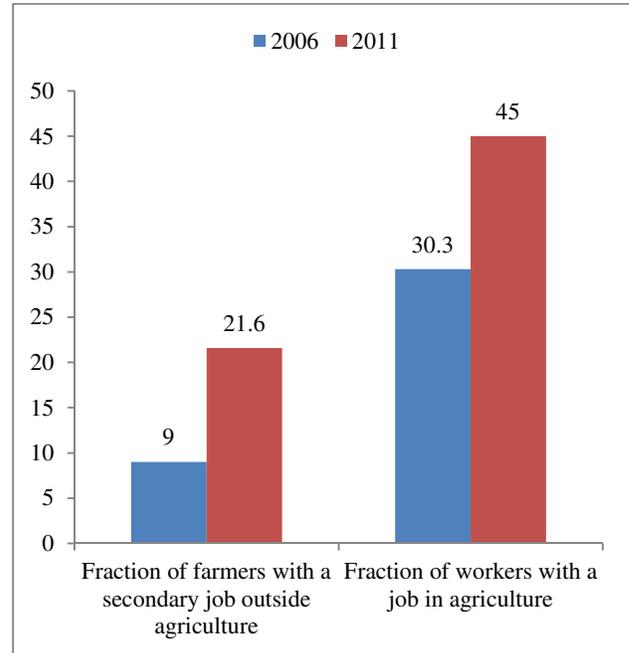
*(Share of main employment per sector, 2001, 2006 and 2011)*



Source: EICV, 2001; 2006; 2011.

**Figure 11: The share of workers with a job outside agriculture has increased by half**

*(Share of workers with an occupation outside agriculture, 2006-2011)*



Source: EICV, 2006; 2011.

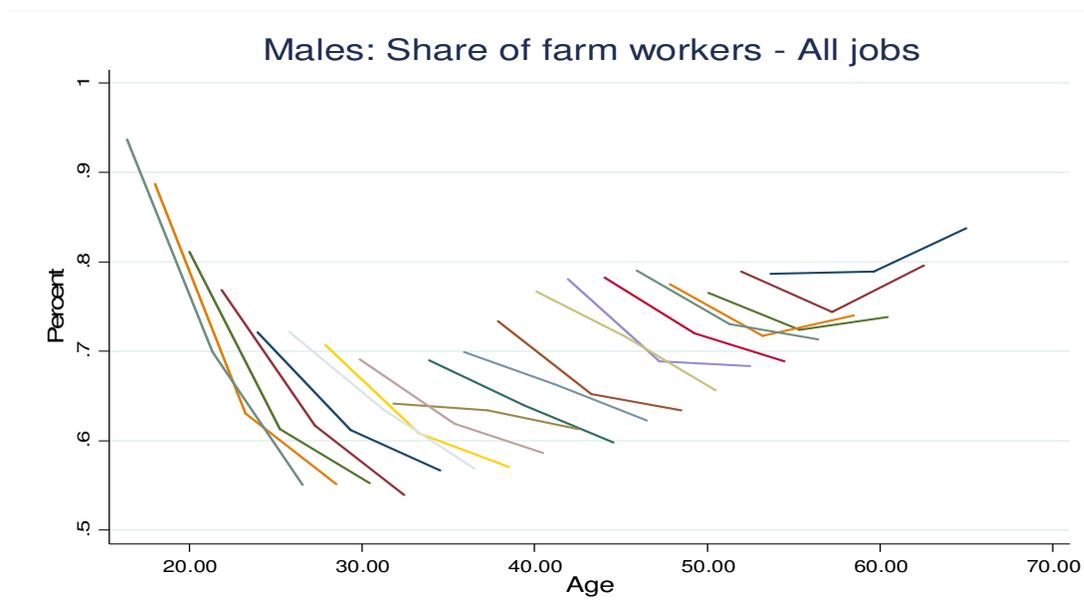
**The move to non-farm occupations has been driven by the youth, in particular young men.**

The share of young men with a job in agriculture sharply dropped between 2001 (starting point of each of the lines in Figure 12), 2006 (middle point of the lines) and 2011 (last point of each line), indicating that more and more young men are abandoning agriculture altogether. Middle-aged and older men do not abandon agriculture, but are increasingly likely to have their main occupation outside farming (while keeping secondary occupations in agriculture). The shift to non-farm employment as primary occupation (as shown in Figure 10) is thus the result of two complimentary dynamics: First, young people are abandoning agriculture altogether and moving to non-farm occupations, while older workers increasingly shift their main occupation outside farming but keep a strong foot on the farm (as secondary occupation).

**Within agriculture, the employment structure is changing too.** The share of workers employed as unpaid labor on the family farm dropped from 38 percent in 2006 to 29 percent in 2011, while the share of wage farmers increased (Figure 13). The move to wage farming is also driven by the youth, and in particular by young women. Although there are no panel data, the net job additions in agriculture between 2006 and 2011 are indicative of young women (16-30) moving from unpaid farming (on the family farm) to paid farming (on somebody else's farm - Figure 14). The employment transitions are substantially gendered: While young men tended to move out of agriculture towards non-farm occupations, young women have shifted employment within agriculture.

**Figure 12: Young men abandon agriculture, older men less so**

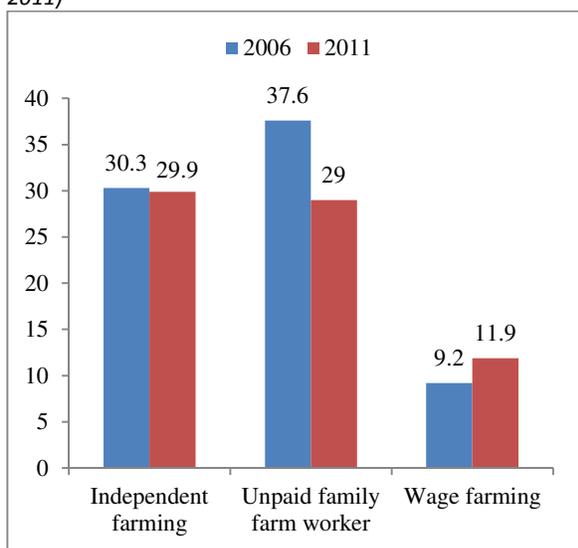
*(Share of cohort with a job in farming, 2001-2006-2011)*



Source: EICV, 2001; 2006; 2011. World Bank staff calculations

**Figure 13: Unpaid farming lost ground to wage farming**

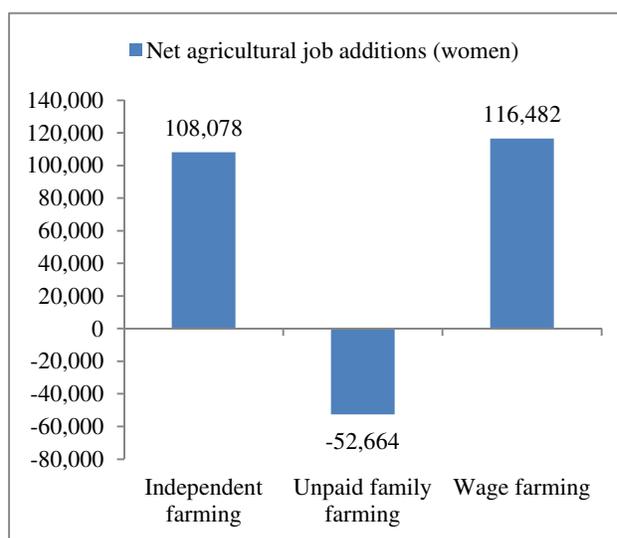
*(Employment share by type of agricultural activity, 2006 and 2011)*



Source: EICV, 2006; 2011.

**Figure 14: Young women move from unpaid to paid farming**

*(Net agricultural job additions for young women, 2006-2011)*



Source: EICV, 2006; 2011.

**Rwandan workers have increasingly taken up additional jobs since 2006.** In 2011, two thirds of workers had several jobs, up from 40 percent in 2006. The increase has especially been salient among workers with a main job in agriculture: 63 percent of agricultural workers had several jobs

in 2011, up from 37 percent in 2006. For farmers, the uptake of additional jobs amounted in large part to a diversification into nonfarm activities (Figure 11). Despite the uptake of additional jobs, the median worker in 2011 worked fewer hours than in 2006 and was more likely to be underemployed: Median hours worked per week in all jobs decreased from 29 in 2006 to 26 in 2011, and the time-related underemployment rate modestly increased from 34 percent to 36 percent.

### *An increase in earnings, correlated with diversification and the uptake of additional jobs*

**Individual labor earnings increased substantially since 2006.** Median earnings from all jobs increased by 66 percent between 2006 and 2011, and the share of workers with earnings below the poverty line decreased from 54 percent to 33 percent. Agriculture led the earnings increase: Earnings of independent farmers almost doubled while those of wage farmers and unpaid farm workers increased by half. As a result, the low earnings rate in agriculture dropped from 59 percent in 2006 to 37 percent in 2011. This is in line with the agriculture-driven poverty reduction as documented by the Rwanda Poverty Assessment.

**Low earnings are increasingly a consequence of underemployment.** While the low earnings rate has dropped, the share of low earners who have low earnings due to short hours (underemployment) increased between 2006 and 2011. In fact, of all low earners in 2011, 58 percent would not be low earners if they could increase hours worked. Low earnings are increasingly a consequence of underemployment rather than insufficient remuneration per unit of time: The share of workers who earn below the poverty line despite working long hours dropped from 12 percent in 2006 to nine percent in 2011, and the share who only manage to escape low earnings by working long hours decreased from seven percent to three percent.

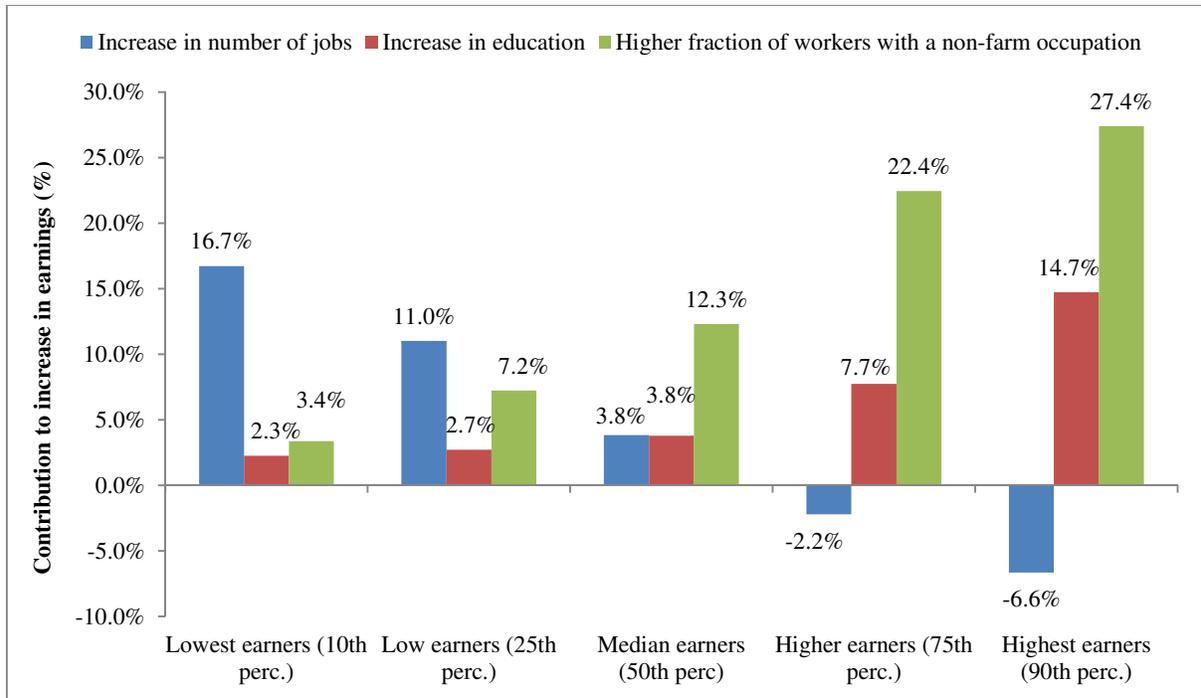
**Diversification into non-farm occupations has been most closely correlated with the increase in earnings.** In a decomposition framework, 12 percent of the increase in median earnings can be accounted for by the higher share of workers with an occupation outside farming (Figure 15)<sup>4</sup>. There are a number of interesting differences in the correlates of earnings growth between lower- and higher-earning workers. Taking up additional jobs has been particularly important for earnings growth of low-earners, while diversification into non-farm occupations, both as main and secondary occupations, explain the largest part of the earnings increase for the higher earners (Figure 15). Poor workers have increased earnings by working more jobs, while better-off workers have boosted their earnings by progressively moving to non-farm activities.

**Figure 15: Taking up additional jobs was a main correlate of earnings growth for low earners, while diversification was more important for higher earners**

*(Contribution to growth in earnings at different points of the earnings distribution)*

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<sup>4</sup> Given the short time frame between the surveys (five years), changes in workforce characteristics explain only a small fraction (22 percent) of the change in earnings.



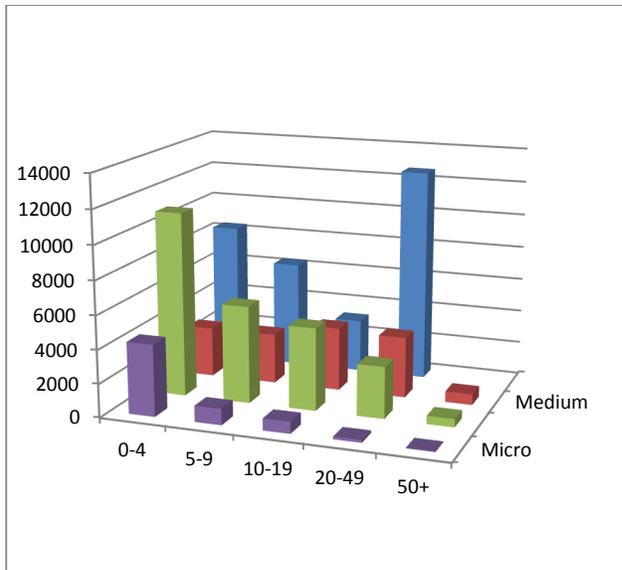
Source: EICV, 2006; 2011; World Bank staff calculations.

### *Solid growth of the formal private sector, from a low base*

**Though the formal private sector in Rwanda remains small, employment has more than doubled between 2006 and 2011.** In 2011, the formal private sector provided (main) employment to 200,000 workers (4 percent of overall employment), up from about 90,000 in 2006. Between 2006 and 2011, a substantial number of formal firms have started operations in Rwanda, generating additional formal sector employment: According to the 2011 Establishment Census, 35 percent of total employment in formal firms was added in the five years between 2006 and 2011.

**Figure 16: Employment in formal firms tends to be concentrated in young firms**

*(Employment in formal firms by age and size)*



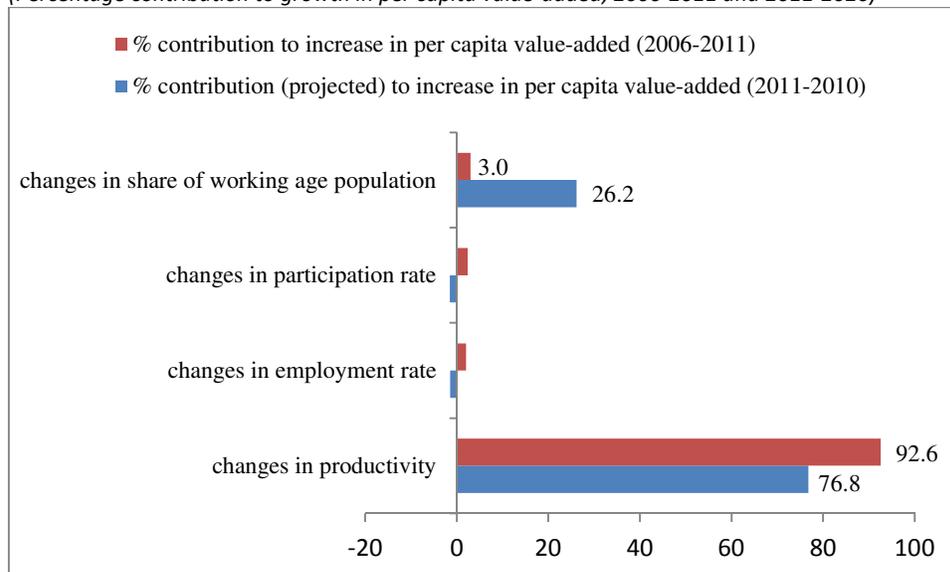
Source: Establishment Census, 2011.

### 3. Going forward: The employment outlook for Rwanda

**Rwanda's economy is projected to grow at rates above 7 percent on average through 2020.** The potential growth rate of the economy-the growth rate that could be obtained if all production factors are used efficiently-is estimated at 7.6 percent for the 2015-20 period, almost similar to the growth rate observed between 2000 and 2013 (7.9 percent per annum). Further increases in labor productivity and the demographic dividend-the increasing share of working-age adults in total population-are expected to drive growth (Figure 17).

**Figure 17: Productivity and demography will drive economic growth**

(Percentage contribution to growth in per capita value-added, 2006-2011 and 2011-2020)

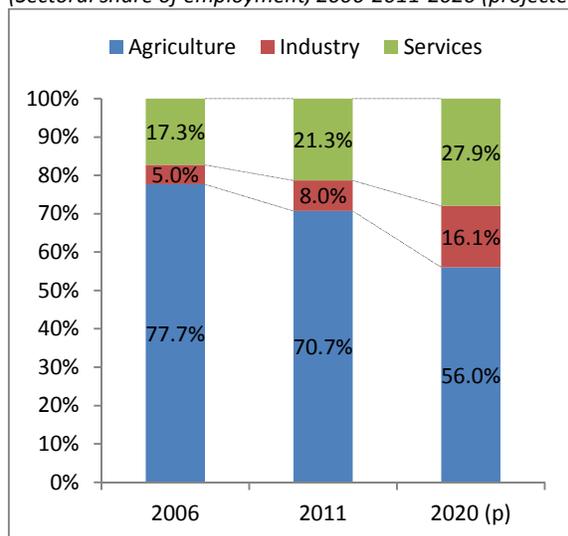


Source: World Bank staff estimates and calculations

**The shift from farm to nonfarm occupations is projected to continue and will be the main driver of productivity increases over the coming five years.** Under a baseline scenario of 7.8 percent GDP growth during between 2011 and 2020 and the same productivity increases as during 2006-11, the share of agriculture in employment will drop to almost half (56 percent) of total employment by 2020, down from about 70 percent in 2011 (Figure 5)<sup>5</sup>. Overall employment is projected to grow by 2.2 million between 2011 and 2020, with most of the employment to be absorbed by the tertiary and secondary sector (Figure 19). Employment in agriculture is projected to grow much slower, pushing down its share in overall employment.

**Figure 18: Agriculture’s share of employment will continue to drop...**

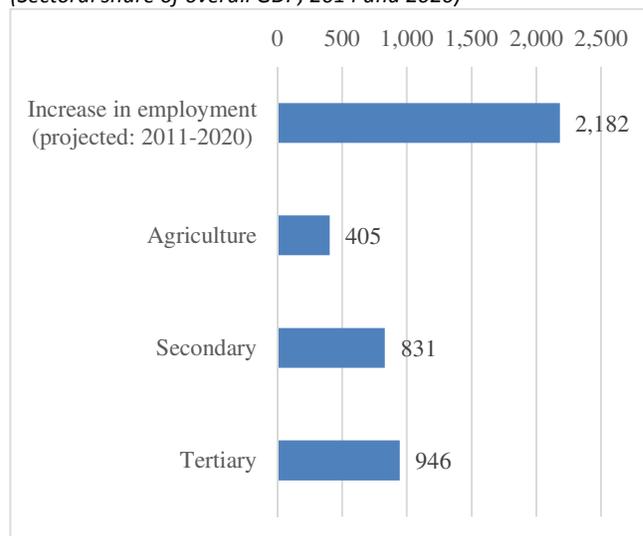
(Sectoral share of employment, 2006-2011-2020 (projected))



Source: World Bank staff estimates and calculations

**Figure 19: As the secondary and tertiary sectors will absorb most of the new workers**

(Sectoral share of overall GDP, 2014 and 2020)



Source: World Bank staff estimates and calculations

**Going forward, Rwanda, as indeed many African countries, is faced with a substantial jobs challenge.** Between now (2015) and 2020, the working age population will grow by 220,000 every year, outpacing the rate of job growth between 2006 and 2011 (126,000 jobs per year). The EDPRS-2 aims for the creation of 200,000 off-farm jobs every year, double the rate of non-farm job creation between 2006 and 2011. The modern wage sector (public and private formal) added 28,000 jobs per year between 2006 and 2011, which means, naively extrapolating, that the bulk of labor market entrants over the coming five years will need to seek employment in the informal nonfarm sector or in agriculture. According to the projections however, reaching the off-farm jobs target is feasible: the secondary and tertiary sectors are projected to add 1.8 million workers between 2011 and 2020 (Figure 19), which comes down to an annual off-farm jobs growth of 200,000.

<sup>5</sup> The projections are based on a forward-looking Shapley decomposition presented in Annex 6. The projections assume that GDP will grow at 7.8 percent between 2011 and 2010, that sectoral growth will be the same as in 2006-2011, and the population will grow according to projections by the World Population Prospects.

**Table 1: Rwanda’s jobs challenge in numbers**

Between 2006-2011:	Between 2015-2020:
126,000 jobs created per year	Increase in working age population of 220,000 per year
92,000 jobs created outside farming	Aim to create 200,000 off-farm jobs per year
28,000 jobs in modern wage sector (private and public)	

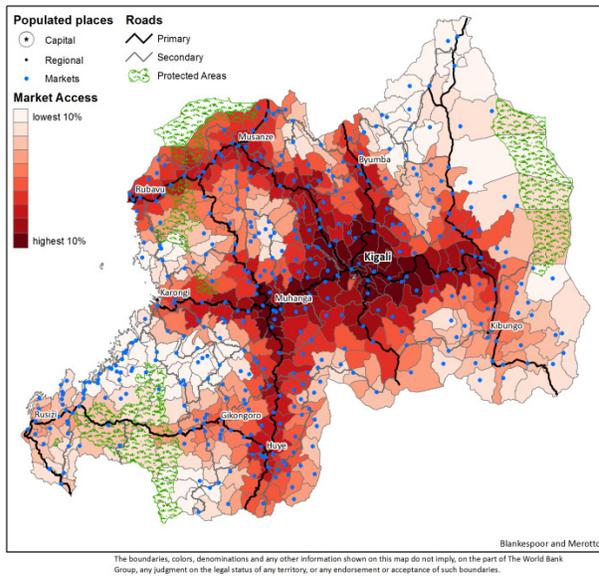
Source: EICV2, EICV3, PHC; World Bank staff estimates and calculations

**Rwanda is faced with the twin challenge of (1) creating sufficient jobs to accommodate the growing labor force and (2) improving earnings for workers in precarious occupations, mainly in subsistence agriculture and the informal non-farm sector.** Although far from a comprehensive strategy, promoting urbanization, improving connectivity to domestic and regional markets-especially in the Western province-and further increasing agricultural productivity could help address those challenges in the medium run.

**First, Rwanda’s nonfarm jobs, especially in the service sector, are concentrated in urban agglomerations (Figure 8).** Developing the urban agglomerations, as the Government is currently planning for six secondary cities, and making creating better conditions for the towns to grow is likely to be associated with increased service activity and increased demand for labor in nonfarm service enterprises. Since the service enterprises in secondary cities mainly serve local demand, increased nonfarm activity and jobs in these cities will require higher agricultural production or development of activities in the secondary sector in these cities (to stimulate local demand from surrounding areas), or better linkages to neighboring countries (to stimulate external demand). Currently, the six secondary towns are service centers, with over three quarters of employment in trade. Based on descriptive data from the Establishment Census, there is scope for tradable firms to expand investment in the towns, in particular in Musanze and Rubavu.

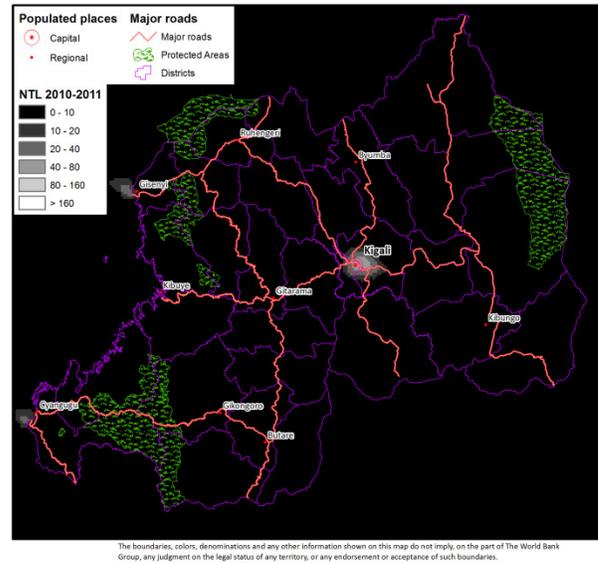
**Second, there appear to be substantial growth opportunities in the Western Province.** The Western Province accounts for the largest share of firms and employment in tradables related to agribusiness, and also for the bulk of jobs in exports. The Western Province however has poor domestic market accessibility, in particular in the southwest around Rusizi and between Rusuzi and Karongi. Figure 20 suggests that improving transport accessibility along Lake Kivu, and electrification around Rubavu and Rusizi may be necessary to stimulate productivity gains for tradable production in the Western Province. In addition, night-time lights show that, apart from Kigali, there is not a single town in Rwanda that matches the economic density of Bukavu and Goma. Rusizi and Rubavu are exceptionally well-placed to exploit the urban demand coming from these cities and could specialize in supplying the urban centers of Eastern DRC.

**Figure 20: Market accessibility is low in the south-west**  
*(Market accessibility index, by sector)*



Source: Establishment Census, 2011

**Figure 21: And electrification is visible only in Kigali, Bukavu and Goma**  
*(Intensity of night lights as seen from space)*



Source: Establishment Census, 2011

**Finally, and this cannot be overemphasized, further increases in agricultural productivity will be required to continue the structural employment transitions.** As argued by the 2013 World Development Report, virtually every episode of mass poverty reduction in modern history has begun with sharp increases in agricultural productivity. A further increase in agricultural productivity remains the main avenue to improving earnings and living standards for the bulk of Rwandan workers. Productivity gains in agriculture will also facilitate a labor reallocation from rural to urban areas, and from farming to non-farming, which has in its turn been an important driver of poverty reduction in Rwanda over the past decade.

# Chapter 1. The growth-employment-poverty nexus: lessons from a decade of economic boom

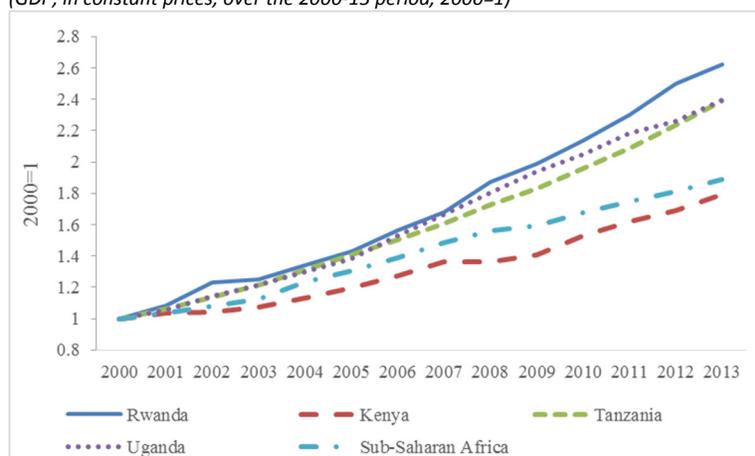
## 1. Trends in GDP Growth, Population, Poverty and Employment

### GDP and Population

Rwanda achieved rapid growth since 2000, resulting in a 170 percent increase in GDP between 2000 and 2013. Prudent macroeconomic policy has enabled the country to achieve high economic growth, poverty reduction and macroeconomic stability. Fiscal and monetary policies geared towards maintaining macroeconomic stability, coupled with an emphasis on building institutional capacity, on promoting good governance, and on creating a business-friendly environment, contributed to low inflation and average annual economic growth of eight percent (between 2000 and 2013). From a regional perspective, Rwanda's macroeconomic performance has generally outperformed its peers and earned the country a spot on the list of the 10 fastest-growing economies in the world (Figure 22).

Figure 22: Rwanda's growth performance outperformed regional peers

(GDP, in constant prices, over the 2000-13 period, 2000=1)

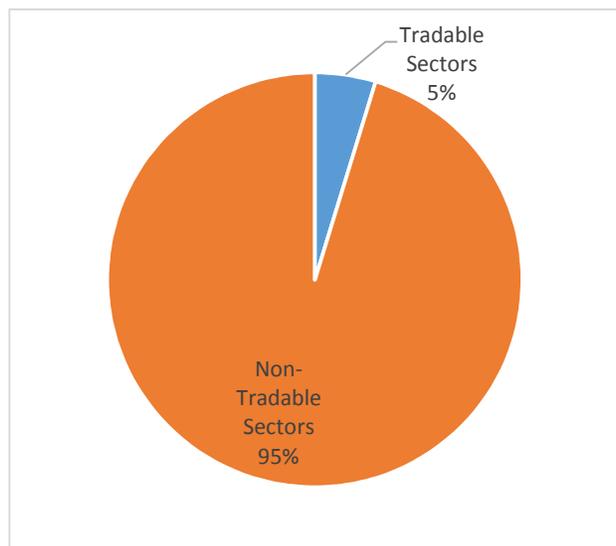


Sources: World Development Indicators.

**Growth in Rwanda has been driven by the non-tradable sector while the contribution from the tradable sector (export crops, manufacturing, and mining) has been limited (Figure 23).** This is reflected in the high-service sector contribution (58 percent) to the overall growth followed by agriculture (24 percent) and industry (18 percent) as well as in growth decomposition by expenditure items (Figure 24). While consumption was the main driver of growth, investment (especially non-construction) only had a limited contribution (Figure 25).

**Figure 23: Non-tradables have been driving growth...**

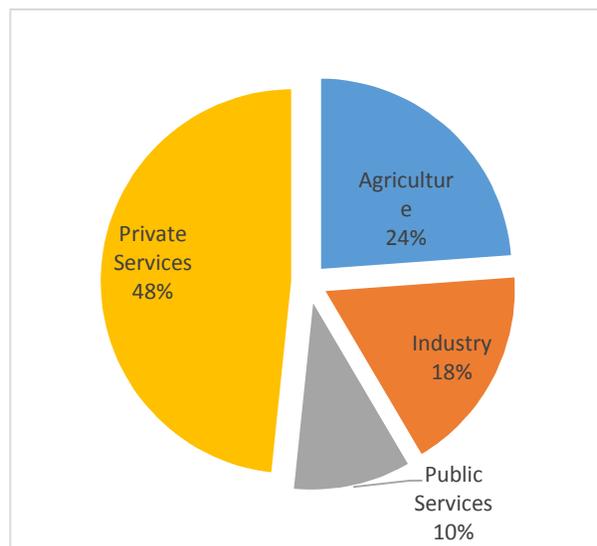
(Contribution to growth, 2006-2014)



Source: NISR, World Bank staff calculations

**Figure 24: ...reflected in the high contribution of services**

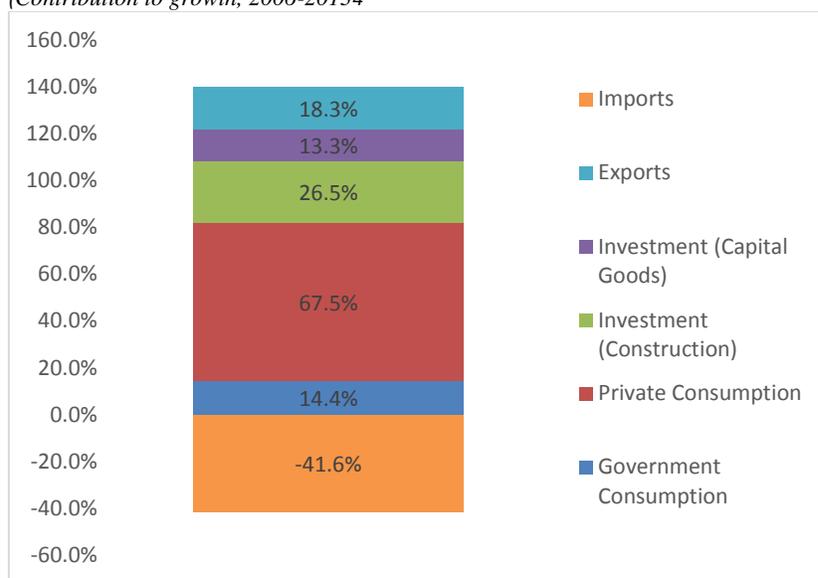
(Contribution to growth, 2006-2014)



Source: NISR, World Bank staff calculations

**Figure 25: Consumption is a main driver of growth**

(Contribution to growth, 2006-20134)



Sources: World Development Indicators.

**Foreign aid and effective use of it have played a critical role in growth and macroeconomic stability.**<sup>6</sup> Net official development assistance (ODA) as a share of GDP remained high at 20 percent in 2011 or 93 percent of gross fixed capital formation, though it declined from over 150

<sup>6</sup> Rwanda's performance on aid effectiveness is the best among 77 participating countries in Yoichiro Ishihara, "Identifying Aid Effectiveness Challenges in Fragile and Conflict-Affected States" (World Bank Policy Research Working Paper No.6037, 2012).

percent in the early 2000s. Aid flows into Rwanda have been redistributed through public expenditures. In the past decade, foreign aid (accounting for 30-40 percent of the budget) has supplemented low domestic tax collections and created fiscal space. While the direct impact of public expenditures has been relatively small (public service contributed 10 percent to the increase in GDP between 2006 and 2013 as illustrated in Figure 25), public expenditures stimulated private services such as trade and real estate. Foreign exchange inflows through aid have also financed the negative current account balance (excluding official transfers) and made the overall balance of payments positive in the past decade.

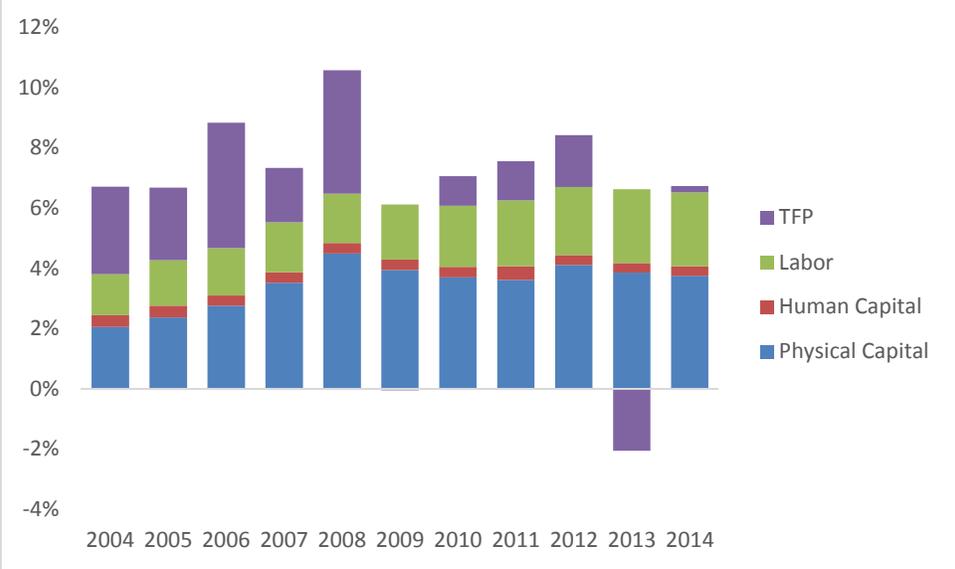
**Public investment financed by aid accounted for more than 50 percent of total investment.**

The share of investment increased from 16 percent in 2006 to 25 percent in 2013, mainly due to investment in construction, whereas investment in capital goods increased only marginally. Although the share of exports increased to 17 percent in 2013, there has been little progress toward export diversification. Traditional products (coffee, tea, and minerals) accounted for almost 60 percent of exports in 2013.

**Rwanda’s growth accounting exercise measures the contributions of different factors such as capital stock, labor, quality of labor (measured by average year of schooling) and total factor productivity (TFP).** The exercise shows that physical capital and total factor productivity were the main drivers of growth. Although the investment rate as a share of GDP remains low, stocks of physical capital have accumulated from a low base (Figure 26).

**Figure 26: Physical capital is the main contributor to growth**

*(Growth accounting exercise, 2004-2011)*



Sources: World Development Indicators.

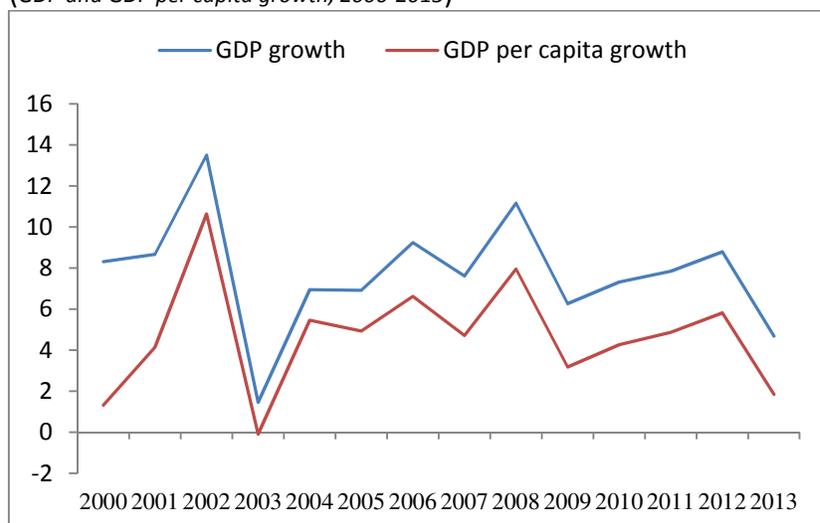
**Rwanda is the most densely populated country on the continent and population growth remains high.**

Population grew at an annual rate of 2.6 percent over the past decade, translating into an increase in real per capita GDP of 87 percent between 2000 and 2013 (as opposed to a 170 percent increase in GDP). Overall, per capita GDP grew at an annual rate of almost five percent

between 2000 and 2013, with the lowest growth recorded in 2003 and 2013 (Figure 27). GDP per capita amounted to US\$639 in 2013, up from US\$342 in 2000 (constant 2013 prices).

**Figure 27: GDP per capita grew at a respectable rate between 2000 and 2013**

*(GDP and GDP per capita growth, 2000-2013)*

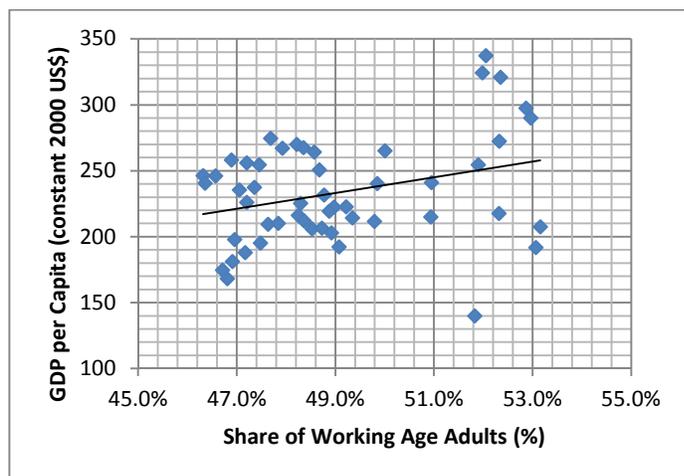


Source: WDI, 2014.

**The age-structure of the population has changed over the past decade, with potentially important implications for future growth.** Driven by a rapid decline in fertility rates, especially

**Figure 28: A Higher Share of Working Age Adults Has Been Associated With Higher Income Levels**

*(Relationship Between Share of Working Age Adults and real GDP per Capita in Rwanda, 1960-2010)*



Source: WPP, 2013; WDI, 2013; World Bank Staff calculations

since 2005, the share of working-age adults in total population increased from 53.4 percent during the 2002 population census to 56.6 percent in the 2012 census. Accordingly, the youth dependency ratio—the number of dependent youth per 100 working-age adults—dropped from 87 in 2002 to 77 in 2012<sup>7</sup>. The share of working age adults in a country’s population is positively related to growth: Between 1960 and 2010, the share of the labor force in Rwanda has fluctuated between a low of 46 percent in the late 1980s and a high of 0.56 in the late 2000s, and a higher share has generally been associated with higher income levels (Figure 28).

<sup>7</sup> Consistent with the Rwandan definition, we define dependent youth as 0-15 and working-age as 16+.

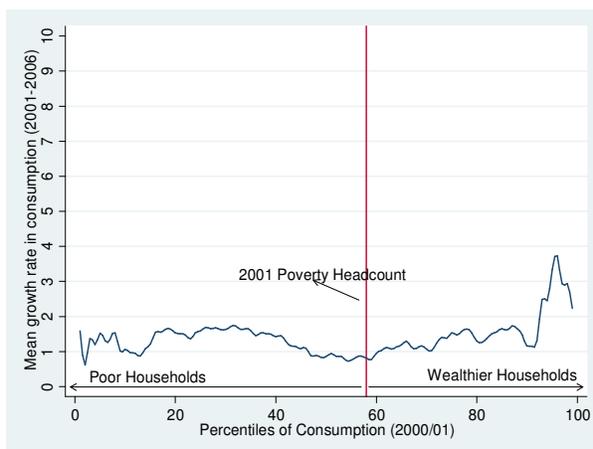
## Poverty

**Rwanda's growth was accompanied by solid poverty reduction.** The share of the population living below the national poverty line decreased from 59 percent in 2001 to 57 percent in 2006 and 45 percent in 2011 (Figure 31). Poverty reduction over the past decade has mainly been driven by increases in agricultural production and productivity and progressive diversification towards non-farm activities. From a decomposition perspective, the increase in household-level agricultural production accounted for 35 percent of poverty reduction over the past decade, while the move to non-farm economic activities accounted for another 16 percent (Figure 32).

**Though aggregate growth was high throughout the last decade, the pace of poverty reduction only picked up since 2006.** Despite average growth of 8 percent per year between 2000 and 2006, poverty only decreased by a disappointing two percentage points (Figure 31). Between 2006 and 2011 however, poverty decreased by 12 percentage points, also with an aggregate growth rate of 8 percent. In the early years of the 2000s household consumption growth was concentrated in Kigali City and benefited the better-off more than the poor (Figure 29). The experience in the second half of the decade was the exact mirror-image: Growth was stronger in rural areas than in Kigali City and benefited the poor more than the non-poor (Figure 30).

**Figure 29: The Non-Poor Grew Faster than the Poor between 2001 and 2006...**

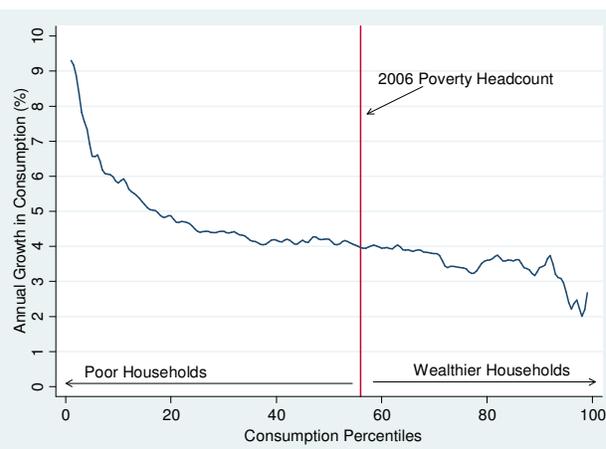
*(Growth-Incidence Curve for Rwanda, 2001-2006)*



Source: EICV1 and EICV2

**Figure 30: While the Poor Grew Faster than the Non-Poor between 2006 and 2011**

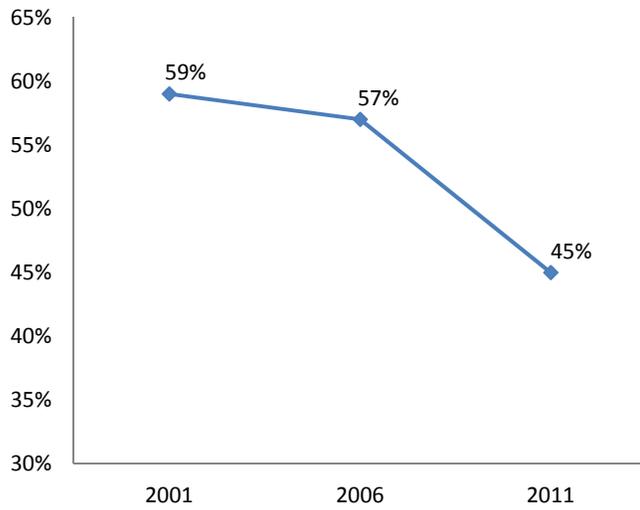
*(Growth-Incidence Curve for Rwanda, 2006-2011)*



Source: EICV2 and EICV3

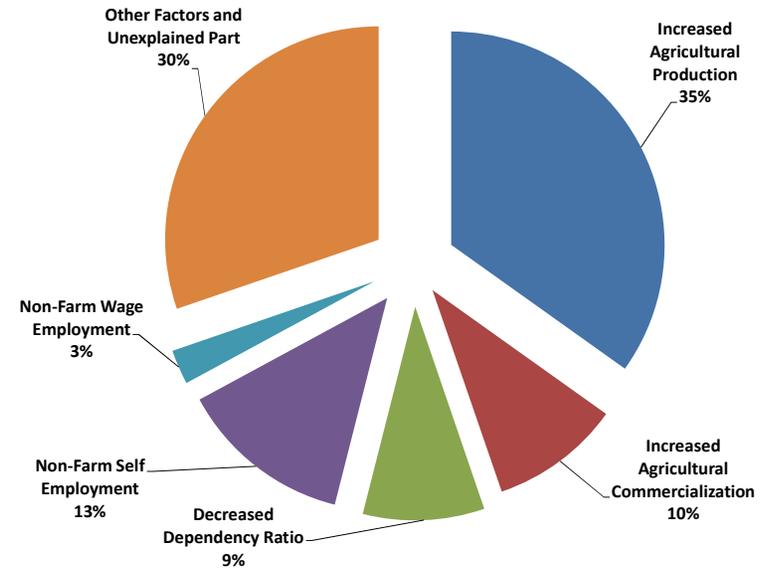
**Figure 31: The percentage of people below the poverty line sharply decreased...**

*(Percentage of people below the national poverty line)*



**Figure 32: ...Mainly driven by agriculture and diversification**

*(Contribution to the reduction in poverty, %)*



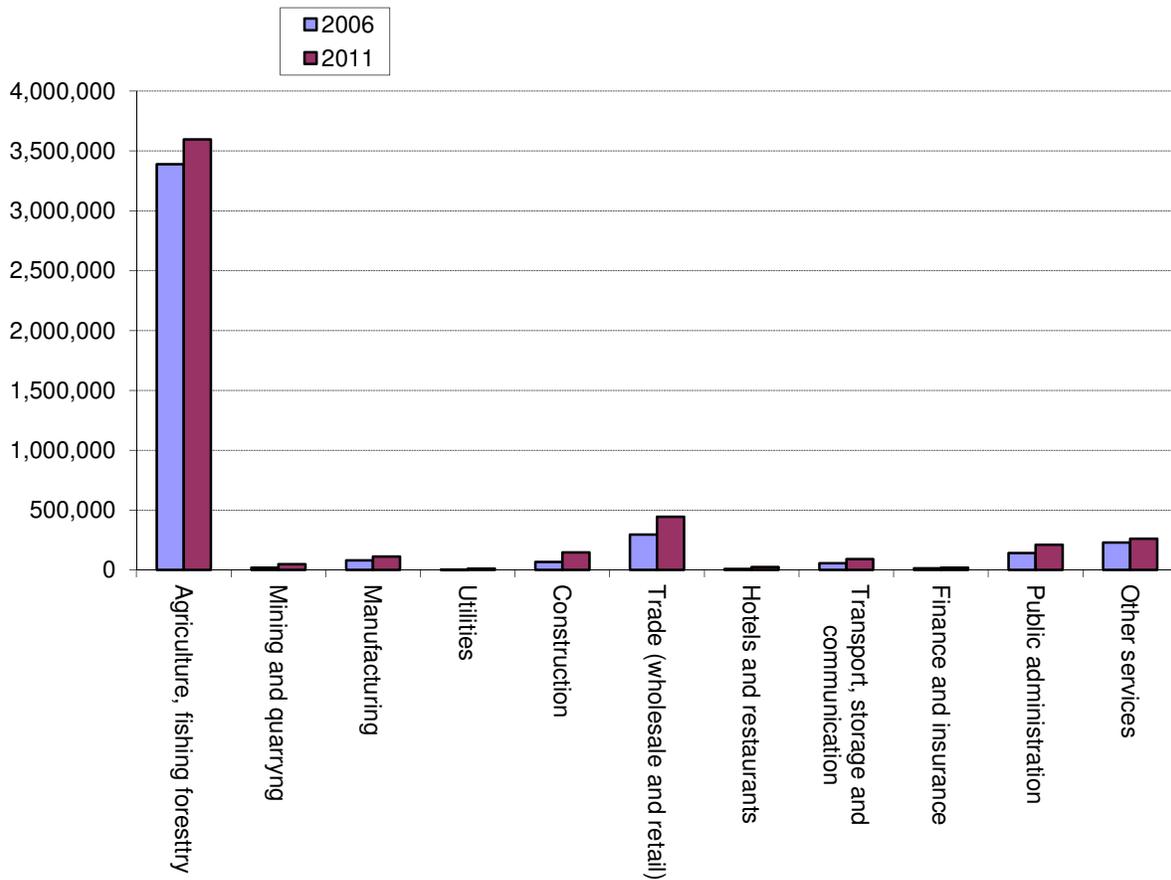
Source: EICV1, EICV2, EICV3, World Bank staff calculations

## 2. Employment and Productivity Trends

**Rwanda's rapid growth has been accompanied by substantial job creation.** Between 2006 and 2011<sup>8</sup>, employment, rose by 15.4 percent, marginally faster than the rapid increase of the working age population. While agriculture added jobs since 2006 (Figure 33), it lost in relative importance as the sector has been adding workers at a much slower rate than the non-farm sectors of the economy. Compared with 2006, the share of agricultural workers has decreased by seven percentage points whereas the share of workers in the services sector has increased by 4 percentage points, of which half are in trade services sector (Figure 35). Industry sharply increased its employment share from a low base. More than 70 percent of the population continues however to be employed in agriculture (Box).

**Figure 33: Agriculture added jobs but at a slower pace than other sectors**

(Number of people employed by sector, 2006-2011)

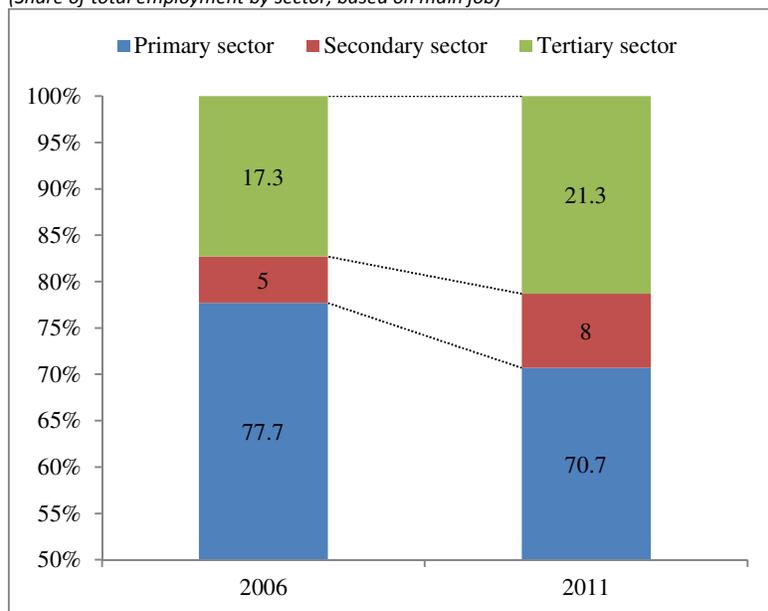


Source: World Bank staff calculations based in NISR data

<sup>8</sup> Latest available household (labor force) survey.

**Figure 34: Agriculture is shrinking as a share of employment**

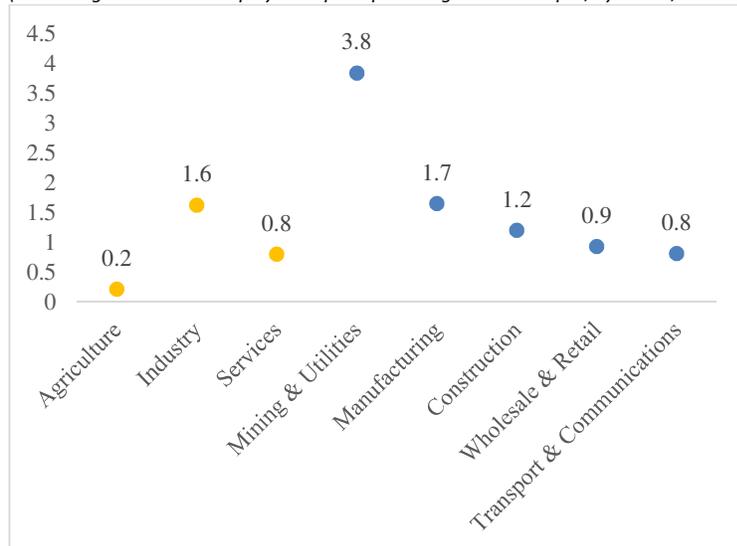
*(Share of total employment by sector, based on main job)*



Source: EICV2; EICV3. World Bank staff calculations

**Between 2006 and 2011, employment was most responsive to growth in industry.** Each percent of output growth in industry was associated with a 1.6 percent growth in employment, compared

**Figure 35: Employment was most responsive to growth in the industry sector**  
*(Percentage increase in employment per 1 percent growth in output, by sector, 2006-2011)*



Source: World Bank staff calculations based in NISR data

high employment base the increase was only modest in relative terms.

to 0.8 percent in services and 0.2 percent in agriculture (Figure 35). The subsector with the highest employment elasticity was mining, where each percent growth in output was associated with an almost four percent increase in employment. The relatively high employment elasticity in mining and other industrial subsectors can partly be explained by the low employment base: employment in mining for instance increased from 18,000 in 2006 to 48,000 in 2011, an increase of 267 percent. Agriculture in contrast added way more jobs, but due to its

**As in many low-income countries, the employment rate in Rwanda is high.** Out of a working-age population of 5.9 million (during the last nationally representative household survey with information on employment, in 2011), 4.7 million were employed (in the week preceding the survey), resulting in an employment to working-age population ratio of 81 percent. The employment rate is down marginally from 82 percent in 2006, largely due to an increase in inactivity rates<sup>9</sup> (Table 2). The increase in the inactivity rate is driven by the higher proportion of young people staying in school.

**Table 2: Select employment indicators, 2006-2011**

	2005/6	2010/11
Unemployment rate	4.6	2.4
Employment-to-working-age-population ratio	81.8	80.9
Inactivity rate	14.2	17.1
Working age population	5,115,771	5,887,514
Working age population as a fraction of total population	53.9%	54.7%

Source: EICV2 and EICV3

**Formal unemployment in Rwanda is low.** In the week preceding the EICV3 survey, 2.4 percent of the labor force was unemployed, in the sense that they were available for work and actively looking for employment. Unemployment is down from 4.6 percent in 2006 (Table 2). Considered on a yearly basis, 0.9 percent of the labor force was unemployed in 2011 (not having worked for 12 months preceding the survey), down from 1.9 percent in 2006. Unemployment is higher in urban areas (8.8 percent vs 1.2 percent in rural areas), among the youth (3.5 percent vs 1.4 percent for 30+), and among the better-off (5.1 percent in the top consumption quintile vs 1.5 percent in the bottom four quintiles).

**Unemployment is an indicator of limited usefulness in low-income agrarian settings.** As most people cannot afford to be unemployed, official unemployment rates are low but underemployment and low quality employment are rampant. The same is true for Rwanda: Almost 70 percent of employed persons work less than 35 hours a week and 36 percent work 20 hours or less. A substantial fraction of workers, particularly youth and women, are employed as unpaid labor on family farms or in non-farm family enterprises. The 19<sup>th</sup> Conference on Labor Statisticians does no longer consider unpaid household workers as part of the labor force, which, if applied to the EICV3 data, would result in an employment-to-working-age-population ratio of 58 percent rather than the 81 percent listed in Table 1<sup>10</sup>.

**Labor productivity has been the main driver of GDP per capita growth between 2006 and 2011.** Output per worker rose by 24.2 percent over this period, explaining 93 percent of the growth in per capita value-added (Table 3). The increase in productivity is linked to aid and public expenditures: A significant share of aid has gone into financing public investment, which has raised productivity. Changes in employment rates and the demographic composition of the population only had marginal effects.

<sup>9</sup> Inactive are those who are of working age but are neither working nor actively seeking employment.

<sup>10</sup> This calculation considers all unpaid household workers as out of the labor force (and hence not employed).

**Table 3: Employment, output, productivity and population, 2006-2011**

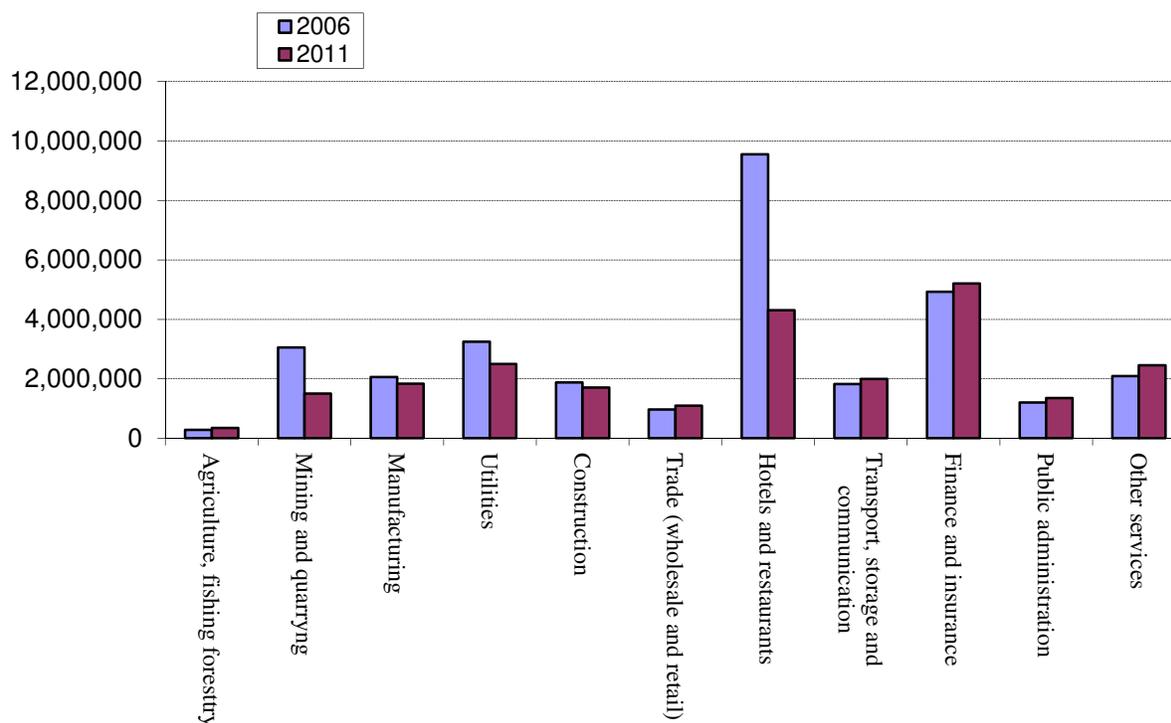
	2006	2011	% change
GDP (value added) (in 1000000000's)	2,504	3,587	43.3
Total population	9,491,397	10,762,085	13.4
Total population of working age	5,115,771	5,887,514	15.1
Total number of employed	4,300,000	4,961,000	15.4
GDP (value added) per capita	263,818	333,300	26.34
Output per worker	582,326	723,040	24.16
Share of population of working age	53.90	54.71	0.81

Source: World Bank staff calculations based in NISR data

**While labor productivity increased overall, some of the non-farm subsectors experienced a net decrease in productivity between 2006 and 2011.** Output per worker declined in the industry sector, most notably in mining and quarrying, and in hotels in restaurants ( Figure 36). The hotels and restaurants subsector experienced the sharpest productivity decline, as the 150 percent increase in the number of employees resulted in a mere 15 percent increase in value added. Productivity however increased in the other services subsectors. The agriculture sector, where the bulk of workers are employed, maintained a trend of rising productivity, with output per worker increasing by 21 percent. Productivity in agriculture remains however a lot lower than productivity in non-farm sectors ( Figure 36). Productivity in the second main employment-generating sector, trade, also increased.

**Figure 36: Productivity increased in the sectors that employ the bulk of workers, but decreased in industry and hotels and restaurants**

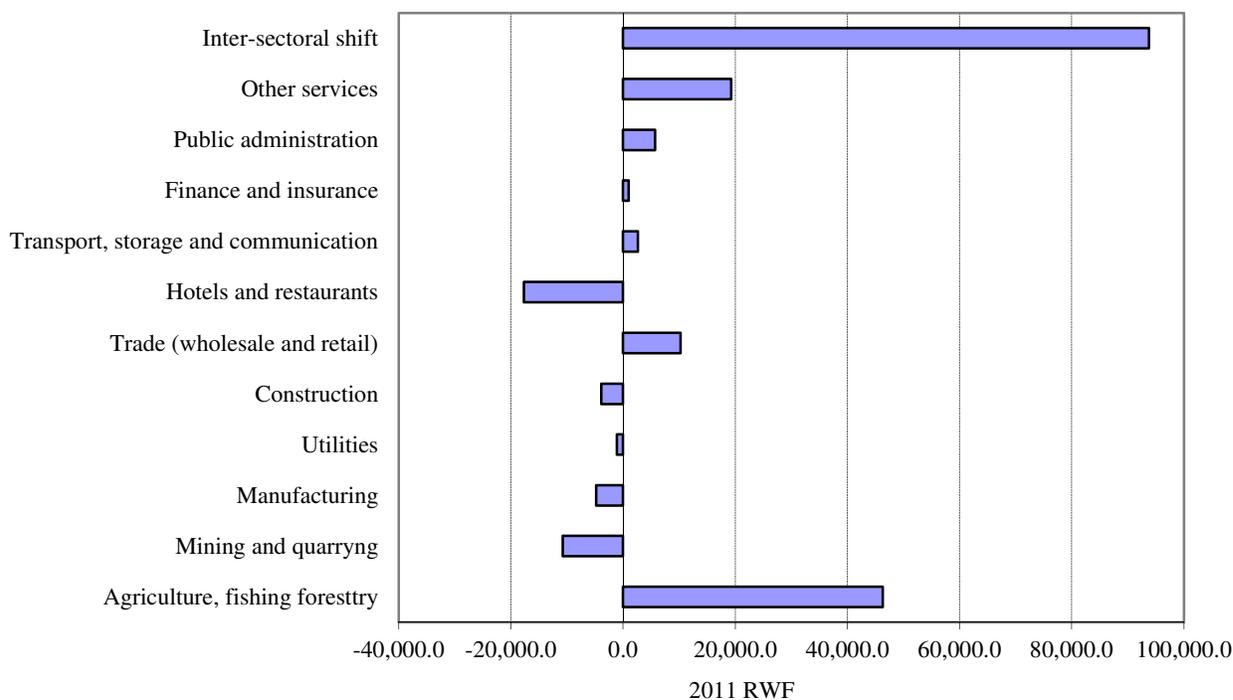
(Output per worker by sector, 2006-2011, in 2011 Rwf)



Source: World Bank staff calculations based in NISR data

**Consistent with the above trends, the overall increase in productivity in the economy was a result of the inter-sectoral shift from agriculture to non-farm sectors and an increase in productivity within agriculture.** The inter-sectoral shift in workers had by far the biggest contribution to the growth of output per worker between 2006 and 2011 (contributed for 66 percent of the overall increase in output per worker), indicating migration of workers from less to more productive sectors. Within sectors, productivity in agriculture (contribution of 33 percent) and trade (7 percent) also had a positive contribution. On the other hand, mining and hospitality sectors were the biggest drag on overall labor productivity.

**Figure 37: The shift from farm to non-farm activities has boosted overall productivity**  
(Decomposition of growth in output per worker, 2006-2011 period)



Source: World Bank staff calculations based in NISR data

### 3. Conclusions

**Rwanda’s solid growth has been accompanied by sizable changes in the economic activity of the population.** The fraction of workers with a main occupation in agriculture is decreasing, and more and more workers, especially the youth (see next chapter) have their main job in non-farm activities. The intersectoral shift from agriculture towards non-agricultural occupations has boosted productivity: Output per worker increased by 24 percent between 2006 and 2011, two-thirds of which was accounted for by the intersectoral shifts. The increase in productivity within agriculture also boosted overall labor productivity, while the secondary sector, in particular mining and manufacturing, were among the biggest drag on overall productivity. Growth in labor

productivity accounted for more than 90 percent of overall GDP per capita growth between 2006 and 2011.

## Chapter 2. A tale of change: The profile of jobs and workers

### 1. Introduction: The 2011 Snapshot

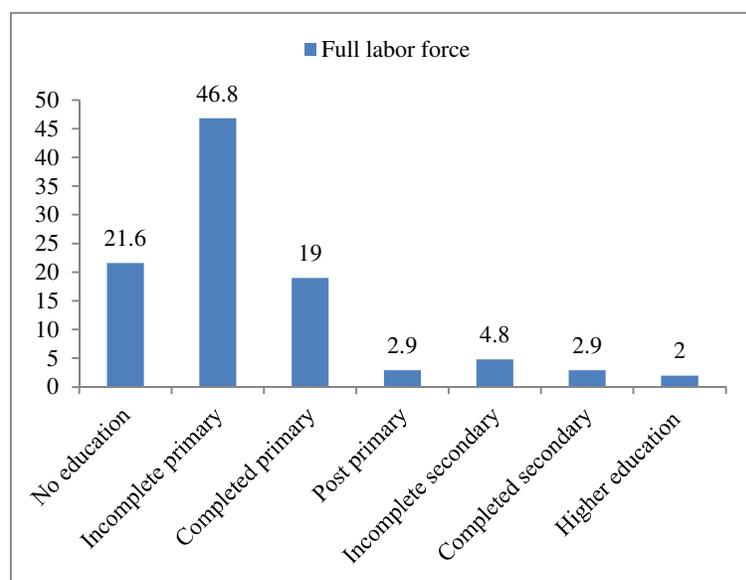
While the focus of this chapter is firmly on the recent employment and earnings dynamics, we kick-off this chapter by briefly describing the current jobs and employment situation in Rwanda in three stylized facts. The remainder of the chapter focuses on the dynamics between 2006 and 2011, using the two latest integrated household living conditions surveys (the EICV2 in 2005/6 and EICV3 in 2010/11)<sup>11</sup>. In some cases, we will also present the longer-term changes between 2000/1 and 2010/11 (using the EICV1 in 2000/1).

#### *Fact 1: A young and low-skilled labor force*

**The labor force in Rwanda is young and low-skilled.** Half of the labor force is between 16 and 32 years of age, and only 20 percent is 50 or older. Despite recent improvements, in particular among the youth, education of the labor force remains low: Almost 70 percent of the labor force did not complete primary education and only five percent completed secondary school or more (Figure 38). One in five labor force participants never entered school to begin with.

**Figure 38: The labor force is largely unskilled**

*(Proportion of labor force participants by education level, 2011)*



Source: EICV; 2011.

#### *Fact 2: Employment dominated by agriculture and informality*

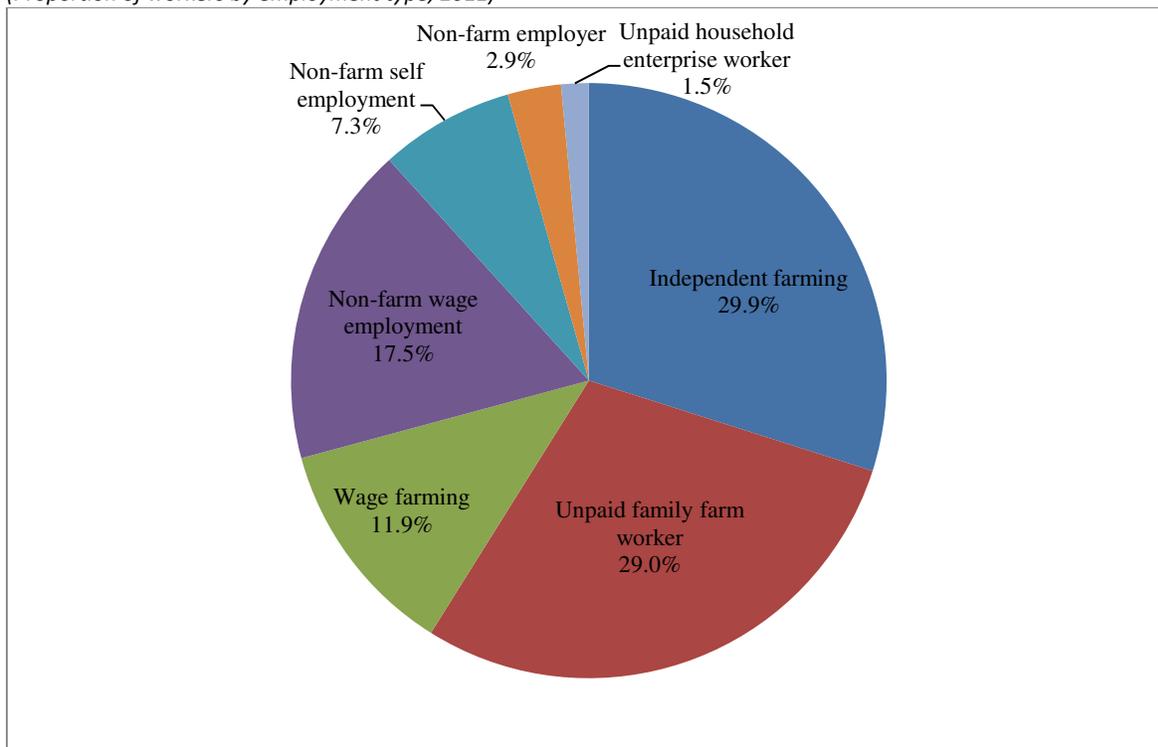
**Agriculture provides employment to the bulk of working Rwandans.** Independent family farming (people cultivating their own or their family's land without a wage) represents the main

<sup>11</sup> See Annex 2 for a discussion of the comparability of the surveys.

employment for 2.9 million working-age Rwandans, accounting for almost 60 percent of overall employment (Figure 39 and Figure 40). Wage farming (people cultivating other people’s land for a wage) provides employment to another 0.6 million people (12 percent of total employment). Taken together, 70 percent of workers have their main occupation in agriculture (the sum of the shares of independent farming, unpaid family farming, and wage farming in Figure 39).

**Figure 39: Agriculture dominates employment**

*(Proportion of workers by employment type, 2011)*



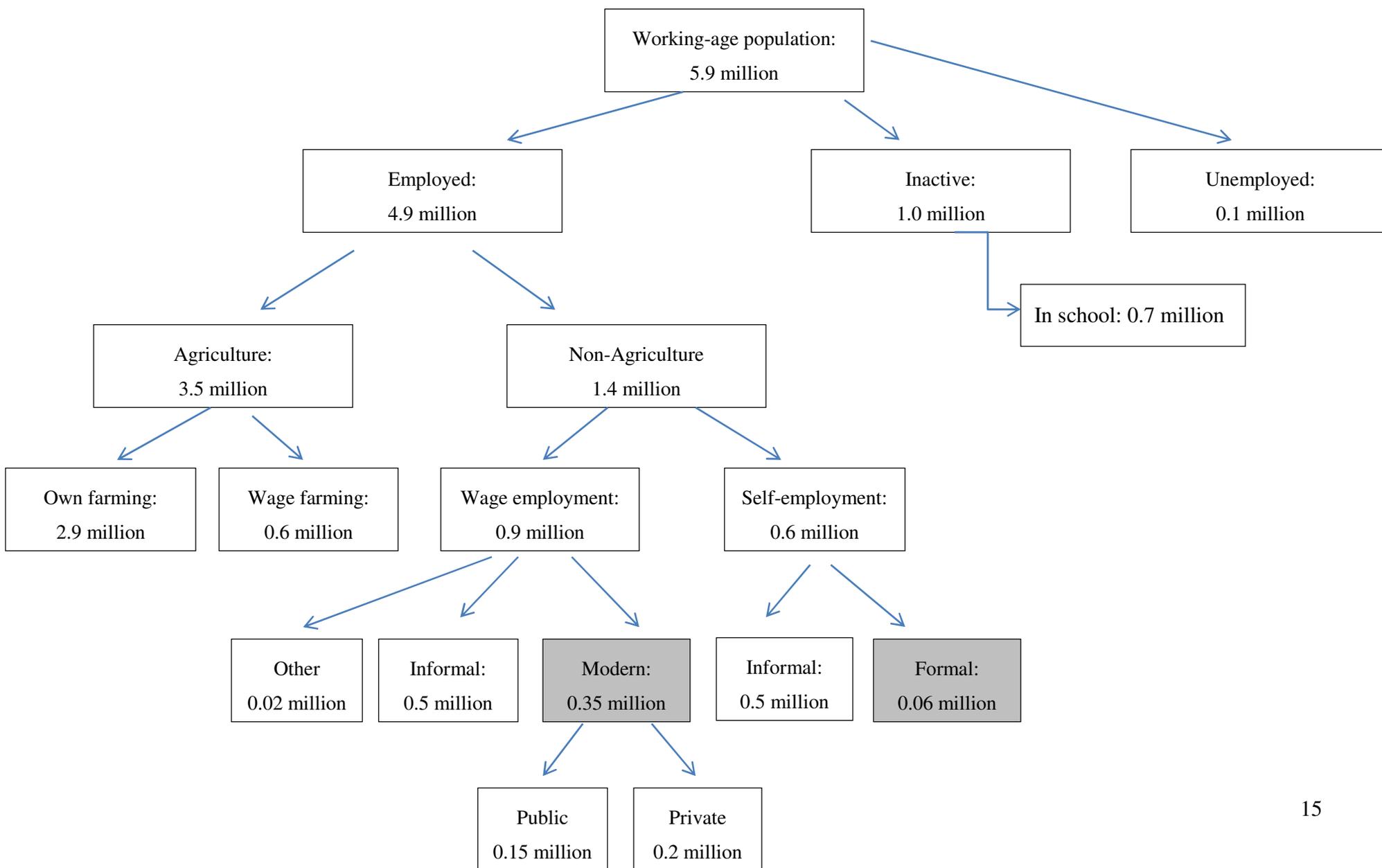
Source: EICV; 2011.

**The non-farm sector is characterized by wage employment and informality.** Approximately 0.9 million Rwandans have their main job in non-farm wage employment, accounting for 19 percent of total employment, while 0.6 million (12 percent) are engaged in independent non-farm business activities (grouping the categories “non-farm self-employment”, “employer”, and “unpaid household enterprise workers in Figure 39). The bulk of employment in the non-farm sector is informal: 60 percent of wage work and 90 percent of independent employment in the non-farm sector is informal.

**The modern wage sector-providing what many would consider “good jobs”-is small.** About 0.15 million workers have their main employment in the public sector, while the formal private sector accounts for another 0.2 million workers (Figure 40). Taken together, the modern wage sector provides employment to approximately six percent of the working-age population. The formal private sector remains marginal in terms of employment, accounting for three percent of the working-age population.

**Figure 40: A snapshot of jobs in Rwanda (2011)**

*(Number of workers per employment category)*

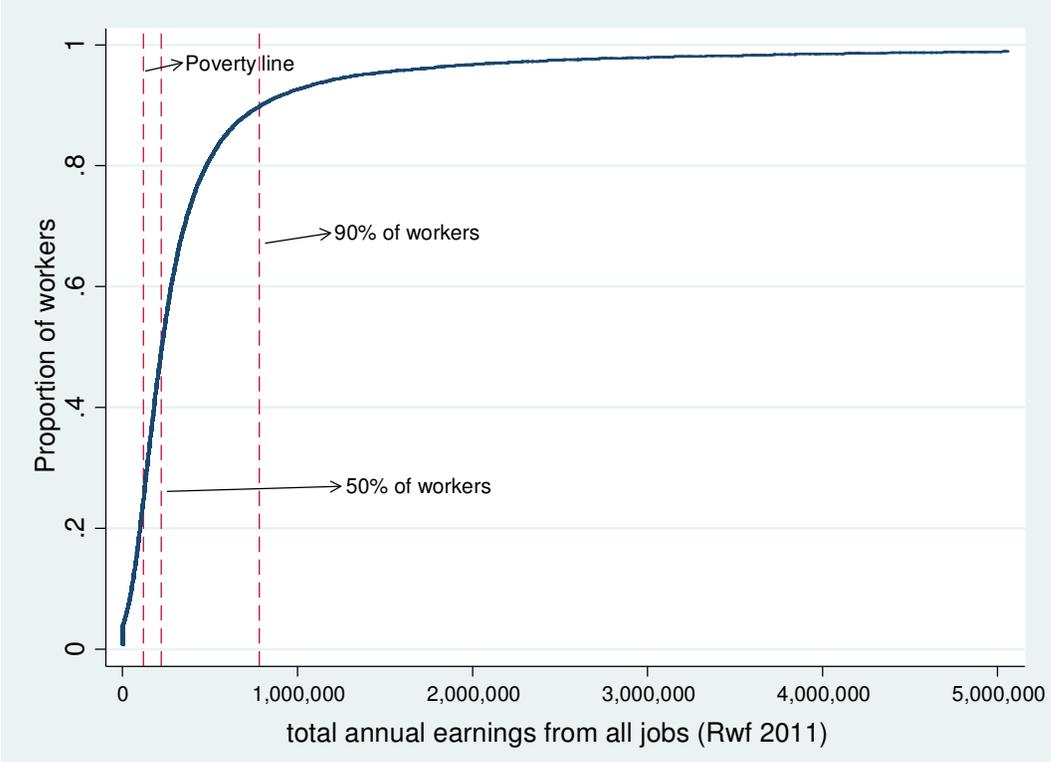


The bulk of jobs in Rwanda do not involve any labor exchange, blurring the distinction between demand and supply and productivity and wages. Most workers are self-employed in agriculture or in small, mainly one-person, enterprises in the non-farm sector. In 2011, wage employment (where people exchange labor in return for a wage) accounted for about 30 of workers (Figure 39). The remaining 70 percent of workers were self-employed in subsistence agriculture or in non-farm businesses.

**Fact 3: Low earnings and widespread underemployment**

For the majority of the population earnings are low (though they have increased considerably since 2006). In 2011, median monthly earnings from all jobs amounted to Rwf 18,175, meaning that half of workers earn Rwf 18,175 per month or less (this amounts to \$ using the official exchange rate and \$54 using the purchasing power parity-adjusted exchange rate)<sup>12</sup>. Half of workers earn between Rwf 113,000 and Rwf 400,000 per year (between 9,400 and 33,300 per month<sup>13</sup>) and 90 percent of workers earn less than Rwf 780,000 per year (Rwf 65,000 per month - Figure 41). Less than six percent of employed Rwandans earn Rwf 100,000 per month or more (approximately \$300 in PPP terms).

**Figure 41: Earnings are low for most workers**  
(Cumulative distribution of annual earnings, 2011)



Source: EICV, 2011. Figure is censored at the 99<sup>th</sup> percentile and does not show top incomes. Negative earnings have been dropped.

<sup>12</sup> Earnings of own-account workers are calculated based on reported turnover and costs in the surveys. See Annex 1 for an explanation on how earnings were calculated.

<sup>13</sup> This is the so-called interquartile range.

**More than 30 percent of workers are engaged in so-called “low-earnings jobs”, jobs that earn less than the official poverty line<sup>14</sup>.** This rises to 45 percent for workers in the bottom 40 percent (Box 2). Low earnings are mainly a consequence of underemployment: 76 percent of workers with low earnings earn below the poverty line because of the short hours they work (Table 4). Almost 40 percent of workers in Rwanda are underemployed, meaning that they work less than 35 hours a week and would like to work more.

**Table 4: Main indicators of employment quality, 2011**

	2011
Median earnings (all jobs)	218,110.4
Median hourly earnings	185.9
Low earnings rate	33.2
Poverty rates among low earners	55.0
Share of low earners who have low earnings due to short hours	57.7
Share of low earners who work long hours	8.8
Share of non-low earners who escape low earnings due to long hours	3.1
Theil index for earnings	133.6
Gini coefficient for earnings	66.3

Source: EICV, 2011. Earnings are expressed on an annual basis in 2011 RwF and include earnings from all jobs.

**Workers in agriculture earn significantly less than non-farm workers.** Median monthly earnings (from all jobs) of an agricultural worker amounted to Rwf 16,000 in 2011 (PPP \$48), substantially lower than for workers with a main job outside farming (Rwf 30,000 – PPP \$89). Within sectors there are important differences too: In farming, wage farmers are the worst-off with over 40 percent of them earning below the poverty line (Table 5). Independent farmers are, relatively speaking, best-off. In the non-farm sector, median earnings are highest for employers and lowest among the self-employed (those working alone in a one-person business).

**Table 5: Earnings in the non-farm sector are substantially higher**

*(Indicators of job quality by type of main employment, 2011)*

Type of employment	Median annual earnings	Low earnings rate (%)
<i>Agriculture</i>	<i>191,952.9</i>	<i>36.6</i>
Independent farming	214,888.3	31.3
Unpaid family farm worker	183,154.5	39.7
Wage farming	166,272.0	41.7
<i>Non-agriculture</i>	<i>360,000.0</i>	<i>23.9</i>
Non-farm wage employment	366,757.2	23

<sup>14</sup> The poverty line amounts to Rwf 118,000 per adult equivalent per year (in 2011 prices).

Non-farm self-employment	278,841.6	28.2
Non-farm employer	592,800.0	16.2
Unpaid household enterprise worker	301,776.0	28.6

Source: EICV, 2011. Earnings are expressed on an annual basis in 2011 RwF and include earnings from all jobs.

**Box 1**

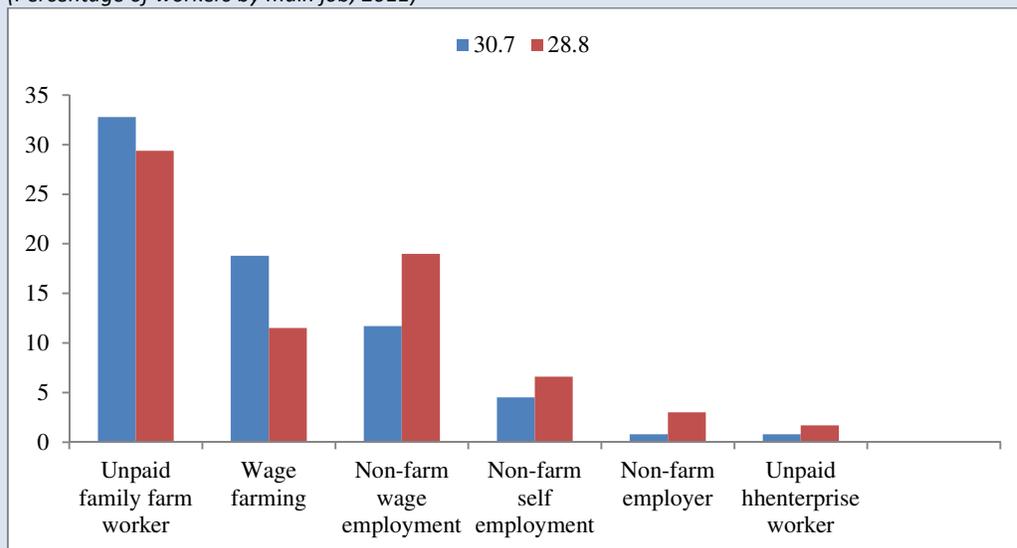
**Female, rural, and heavily dependent on agriculture**

*The characteristics of the bottom 40 percent are unsurprising*

**Workers in the bottom 40 percent remain overly dependent on agriculture and, by consequence, the vicissitudes of unpredictable weather patterns.** In 2011, over 80 percent of the bottom 40 had their main job in agriculture, compared to 70 percent for the overall population and 62 percent of workers in the top 60. Within agriculture, the bottom 40 percent are also overrepresented in the worst types of jobs: Over 50 percent have their main job in wage farming or unpaid family farming, compared to 40 percent of the overall population (Figure 42). Though the bottom 40 workers are more likely to work several jobs, they are less likely to have a secondary job outside agriculture: 36 percent of the bottom 40 has a secondary job outside agriculture, compared to 44 percent of the general population.

**Figure 42: The bottom 40 percent rely predominantly on agriculture**

(Percentage of workers by main job, 2011)



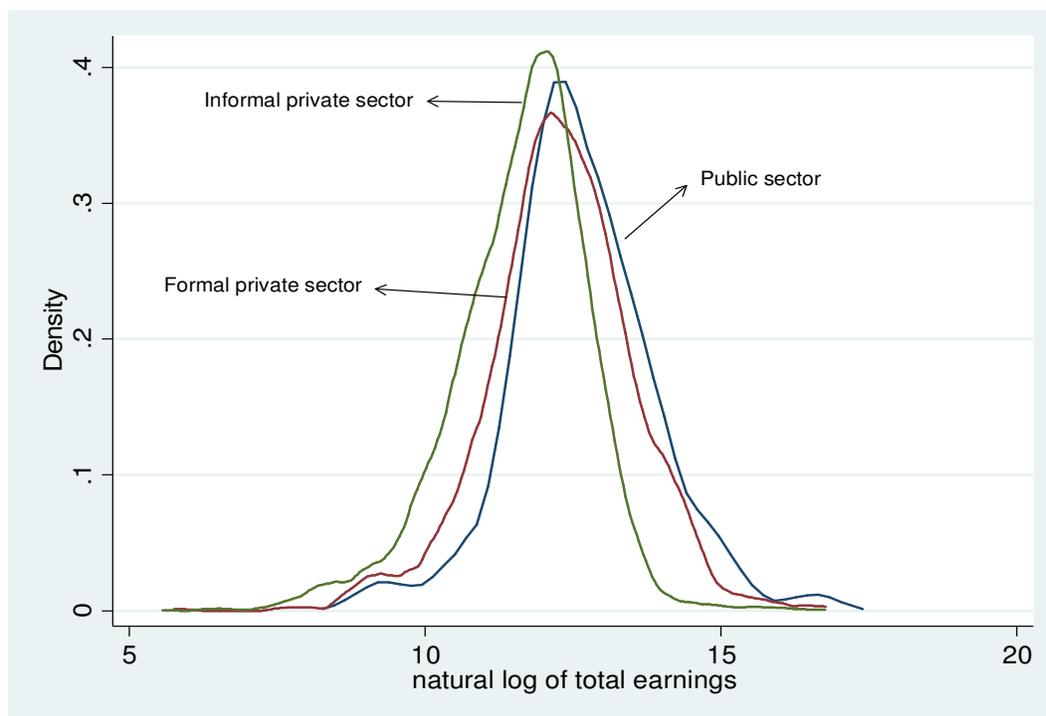
Source: EICV, 2011.

**Earnings of the bottom 40 are low.** 45 percent of workers in the bottom 40 earn below the poverty line, compared to 32 percent of the general population. In 2011, half of the bottom 40 workers earned Rwf 13,400 per month or less (PPP US\$ 40). Workers in the bottom 40 are on average somewhat older (median age of 35 compared to 32 overall), more likely to be female (58 percent of the bottom 40 is female), and overwhelmingly rural (94 percent live in rural areas). Despite poor earnings, growth in earnings between 2006 and 2011 has been pro-poor, with especially the bottom 40 experiencing a strong earnings increase from a low base (see further).

**In non-farm wage employment, the modern sector provides the highest earnings.** Median earnings in the public sector amounted to approximately Rwf 50,000 per month in 2011 (PPP \$150), compared to Rwf 41,600 (PPP \$124) in the formal private sector and Rwf 22,100 (PPP \$66) in the informal private sector (Figure 43). Working in the non-farm sector seems uniformly better than farming: Even the least attractive non-farm activity (wage employment in the informal private sector) is associated with higher earnings than any of the agricultural types of employment (Table 5).

**Figure 43: Wage earnings are highest in the public sector**

*(Distribution of earnings for employees in the public, private formal, and private informal sector, 2011)*



Source: EICV3, 2011; World Bank staff calculations.

**Public sector workers' higher earnings are largely a result of their better endowments.** Using the Oaxaca-Blinder decomposition, we find that 80 percent of the earnings differential between the public and the formal private sector is due to differences in workers' characteristics, in particular public sector workers' higher educational attainment and older age (see Annex 2). There are no discernible differences in returns to characteristics between the public and private formal sector (that is, public sector workers do not appear to get paid more for similar characteristics). Different returns to characteristics do however explain a significant part (38 percent) of earnings differences between the private formal and informal sectors. In particular, returns to education are significantly higher in the formal than in the informal sector (Annex 2).

**The stylized facts paint a bleak picture of the employment situation in Rwanda, characterized by agriculture, informality, and low earnings.** Nevertheless, the employment situation has markedly improved since 2006 and there have been a number of firmly positive evolutions, most notably a diversification into non-farm occupations and a strong increase in earnings. The following sections focus on these dynamics and highlight the role played by young workers as an engine of change.

## 2. What workers do and the way they do it are changing

### 2.1 A move from agriculture to non-farm occupations

**One of the most salient evolutions over the past decade is the progressive move towards non-farm occupations.** In 2011, 30 percent of employed Rwandans had their main job outside agriculture, up from 23 percent in 2006 and 11 percent in 2001 -Figure 44<sup>15</sup>. The move to non-farm occupations happened both for wage and self-employment: The share of workers with a main job in non-farm wage employment increased from 13 percent in 2006 to 18 percent in 2011 (coming from a mere eight percent in 2001), while the share of non-farm self-employment increased from 10 percent to 12 percent (but increased significantly from the five percent in 2001). The decline in agricultural employment is mainly due to a big drop in unpaid family farm workers: 29 percent of workers had their main job in unpaid family farming in 2011, down from 38 percent in 2006 (Table 6).

**Figure 44: Agriculture is declining as a share of total employment**

(Category of main employment as a share of total employment, 2001-2006-2011 )



**As most workers in Rwanda are engaged in multiple jobs, focusing on the main job only (as Figure 44 does) can be misleading.** In the case of Rwanda, the move out of agriculture is not contradicted when considering all jobs instead of just the primary job: the proportion of farm jobs in the total number of jobs in Rwanda decreased from 86 percent in 2001 to 68.4 percent in 2011, a reduction of 17.6 percentage points. On the contrary, farm jobs increased their share in secondary employment by three percentage points between 2001 and 2011 (Figure 47). While the absolute number of people working in agriculture as main employment is largely flat over the past decade, the number of jobs in farming has increased substantially (Figure 48). The overall picture is

<sup>15</sup> Main employment is defined as the job in which the person worked most hours in the 12 months preceding the survey. Defining the main job as the job that procures the biggest share of income does not result in any qualitative changes.

indicative of a transformation occurring in the country with an increasing number of secondary jobs being taken up in agriculture by workers whose primary job is progressively shifting towards non-agricultural sectors.

**Box 1**

**A Transition on Steroids**

*At the start of the millennium, agriculture’s employment share was far above the regional low-income average; it has quickly converged since*

The share of workers employed in agriculture has decreased sharply since the turn of the century (Figure 44). This transition has not been limited to Rwanda. Indeed, Africa’s decade of strong growth has been accompanied by a reallocation of labor from agriculture to on average more productive non-farm sectors. The transition has however been particularly fast in Rwanda: In 2000, the employment share of agriculture was substantially higher in Rwanda (89 percent) than in other low-income African countries (77 percent on average for countries with data)<sup>16</sup>. By 2010, Rwanda still had a higher share of employment in agriculture (72 percent vs 69 percent as the low-income average), but the gap had substantially narrowed (Figure 45). By 2010, the employment structure in Rwanda looked similar to that of other low-income countries in Africa, though the share of services in total employment was a little lower (Figure 46).

**Figure 45: Labor reallocation has been particularly fast in Rwanda...**

*(Agriculture’s share of employment)*



Source: World Bank, 2013;<sup>17</sup>

**Figure 46: ...and agriculture’s share of employment is now comparable to the average for low-income SSA**

*(Employment share by sector)*



Source: World Bank, 2013;

<sup>16</sup> The employment shares for Rwanda presented in Box 1 are slightly different than the ones presented in Figure 49 due to the standardized nature of the I2D2 database.

<sup>17</sup> World Bank. (2013). “International Income Distribution Database (I2D2)”. Washington, D.C.: World Bank.

**Table 6: Unpaid family farming drops as a share of total employment, non-farm wage employment on the rise**

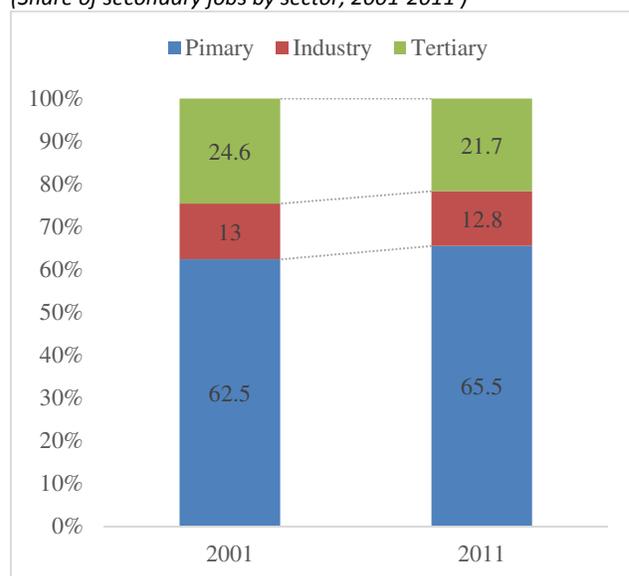
*(Main employment as a share of total employment)*

Type of employment	2006	2011	Percent change
<i>Agriculture</i>	77.1	70.8	-8.2%
Independent farming	30.3	29.0	-1.3%
Unpaid family farm worker	37.6	29.9	-22.9%
Wage farming	9.2	11.9	29.3%
<i>Non-agriculture</i>	22.9	29.2	27.5%
Non-farm wage employment	12.6	17.5	38.9%
Non-farm self-employment	7.2	7.3	1.4%
Non-farm employer	0.6	2.9	383.3%
Unpaid household enterprise worker	2.5	1.5	-40.0%

Source: EICV, 2006; 2011.

**Figure 47: A bigger share of secondary jobs are now in agriculture**

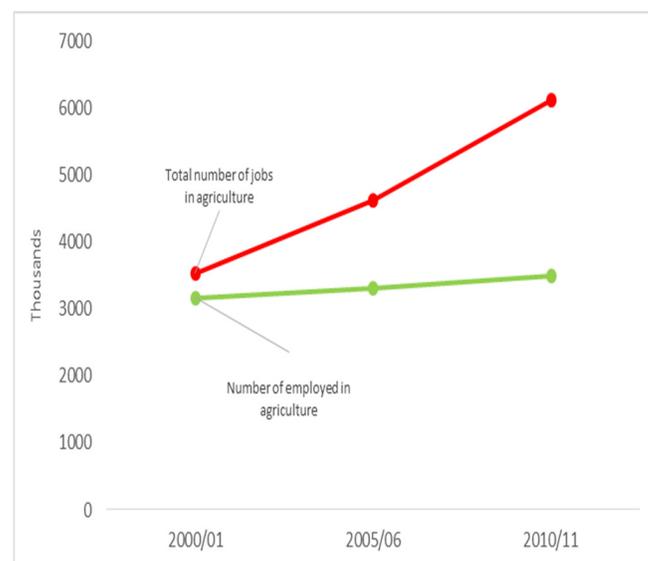
*(Share of secondary jobs by sector, 2001-2011)*



Source: EICV, 2001; 2011. World Bank staff calculations.

**Figure 48: Agricultural jobs are on the rise, though not as primary occupations**

*(Main employment and total number of jobs in agriculture)*



Source: EICV, 2001; 2006; 2011. World Bank staff calculations

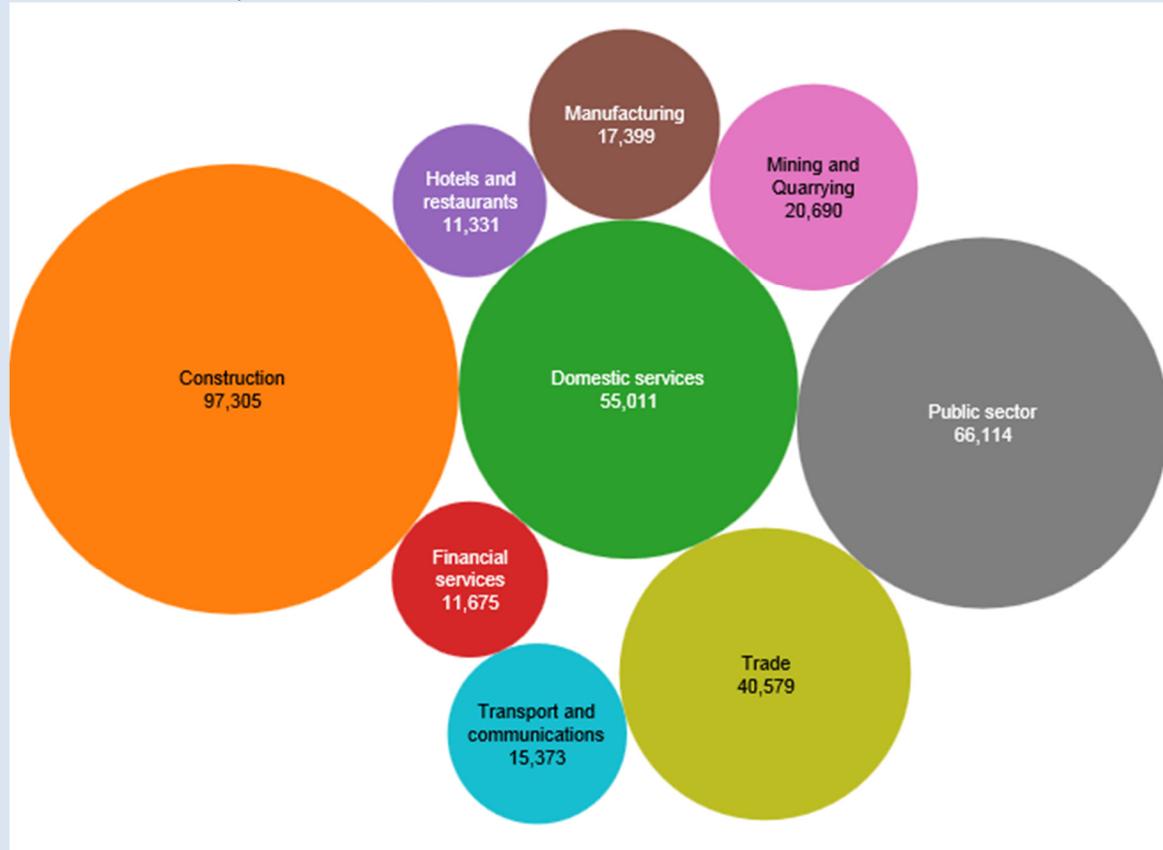
**The non-farm sector accounted for the bulk of new employment since 2006.** There were approximately 0.6 million new workers working in 2011 (compared to 2006), 73 percent of whom took up employment in the non-farm sector (Figure 50). Non-farm wage employment accounted half of new workers (51 percent), with especially the private sector absorbing many new workers: The informal private sector added 300,000 wage workers (a three-fold increase since 2006), while the formal private sector added 100,000 (a doubling since 2006). Considering both the public and the formal private sector, modern wage employment grew by 67 percent between 2006 and 2011.

**Box 2****What are Rwanda's non-farm wage workers doing?  
Government, construction, and domestic services**

**What does non-farm wage employment look like in Rwanda?** The public sector dominates wage employment in the non-farm sector, accounting for 20 percent of overall non-farm wage employment, followed by construction (19 percent) and domestic services (17 percent). The remaining share of wage employment in the non-farm sector is scattered over a large variety of sectors and occupations, mainly retail trade (five percent), transport (five percent), and mining and quarrying (four percent). Government (66,000 new workers), construction (100,000 new workers) and domestic services (55,000 new workers) also accounted for the bulk of wage job additions in non-farm sector since 2006 (Figure 49).

**Figure 49: Construction, government, and domestic services account for the bulk of new non-farm wage jobs**

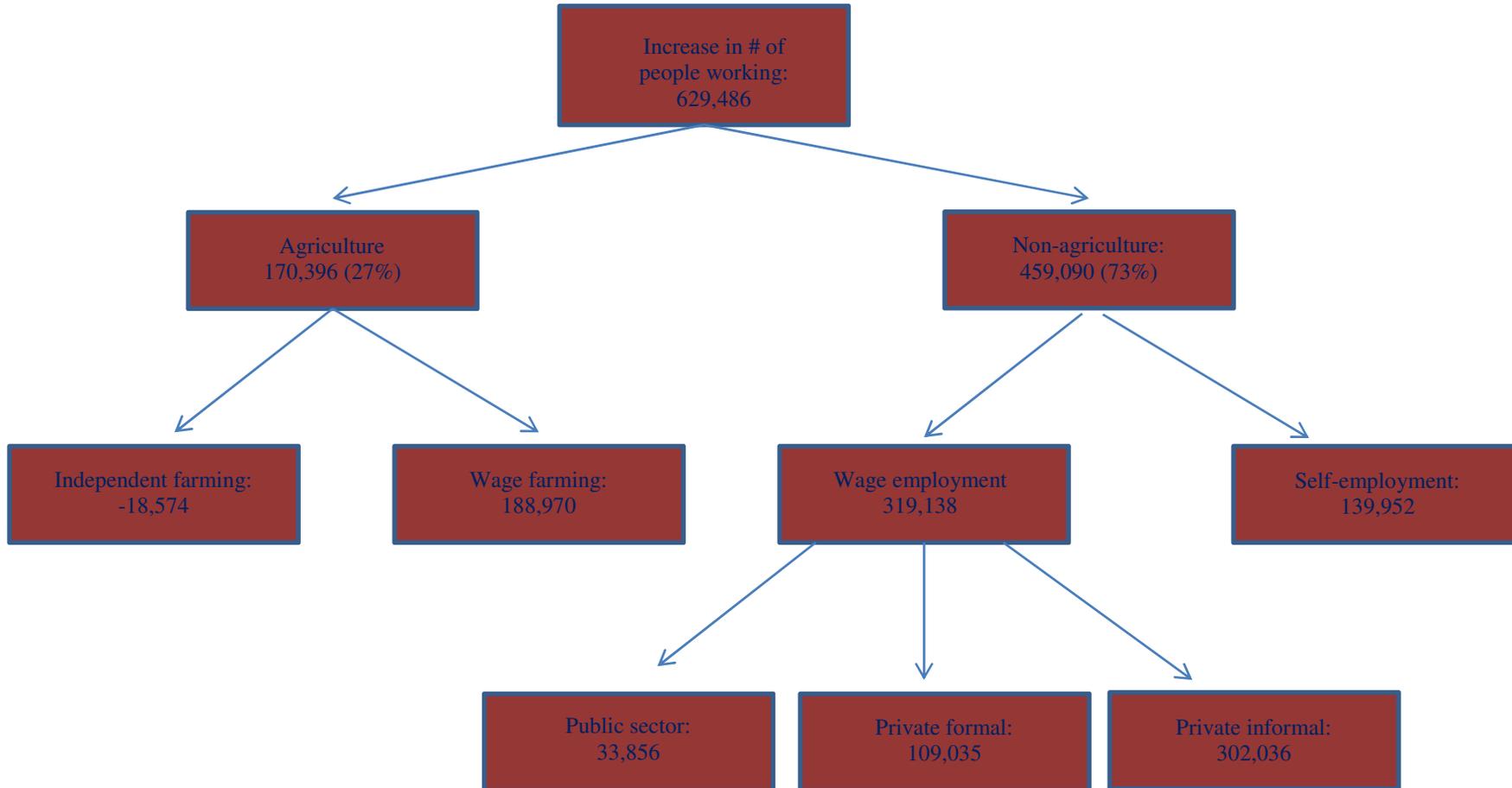
*(Net worker additions by sector, 2006-2011)*



Source: EICV, 2006; 2011.

**Figure 50: The non-farm sector accounted for the bulk of new jobs since 2006**

*(Sector of work and occupation of new workers added between 2006 and 2011)*

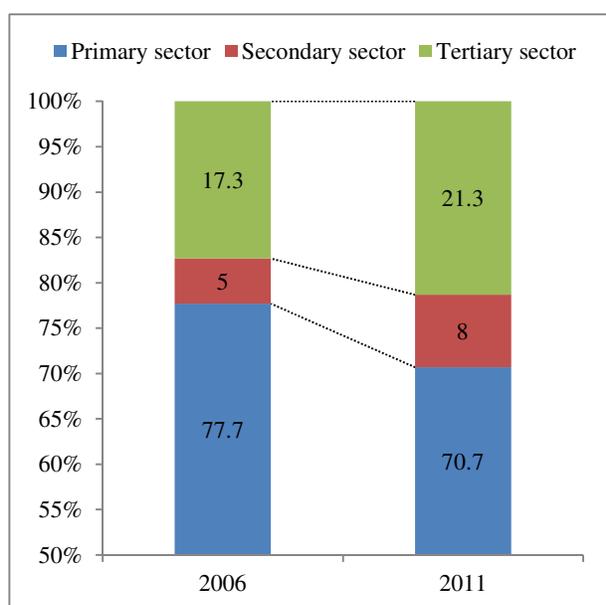


Source: EICV, 2006; 2011. The category “independent farming” pools independent farmers and unpaid family farm workers. For wage employment, the subcategories do not sum to the total new workers in wage employment, as the number of wage workers in “other” wage jobs (not shown in the diagram) decreased substantially since 2006.

**The reduction in the share of agriculture has been accompanied by an increase in the share of services and industry.** The proportion of workers with a main job in the primary sector (agriculture and fishing) decreased from 78 percent in 2006 to 71 percent in 2011, while the tertiary sector (commerce, community and personal services, government services, transport, etc.) increased from 17 percent to 21 percent (Figure 10). Main employment in the secondary sector (construction, manufacturing, mining, etc.) increased too, although from a low base (three percentage point increase). The service sector added most jobs since 2006: 309,000 workers joined the tertiary sector, compared to 183,000 for the secondary sector and 172,000 in the primary sector (Figure 11).

**Figure 51: The employment share of the primary sector decreased since 2006**

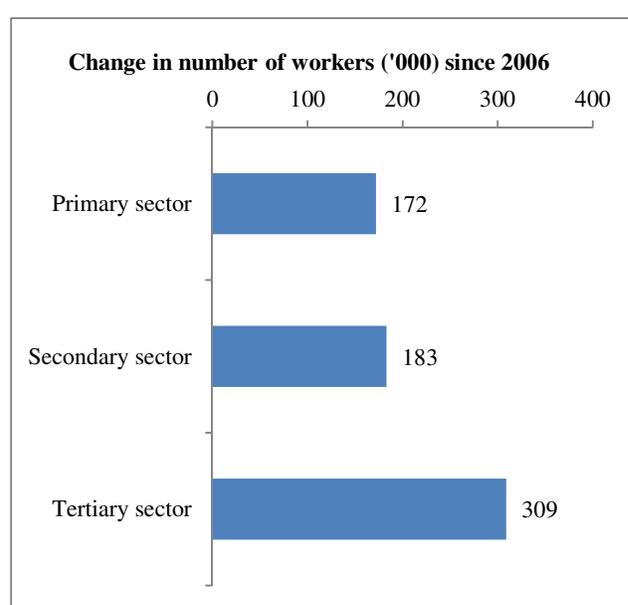
(Share of workers per sector, 2006 and 2011)



Source: EICV, 2006; 2011.

**Figure 52: ...and the tertiary sector added the most workers**

(Change in number of workers per sector, 2006-2011)



Source: EICV, 2006; 2011.

**The move to non-farm employment was particularly important for men.** The share of male workers with a main occupation outside farming increased from 33 percent in 2006 to 42 percent in 2011, while the share for women remained low at 19 percent, up from 15 percent in 2006 (Table 7). Male workers transitioned mainly to wage employment in the non-farm sector, whose share in total employment increased by eight percentage points. Though women also increasingly had their main occupation in non-farming, the main change for women happened within the agricultural sector, with unpaid work on the family farm losing importance to independent farming and wage farming (Table 7)<sup>18</sup>.

<sup>18</sup> This will be explored in more detail in a later section.

**Table 7: Men in particular are transitioning to non-farm employment***(Main employment as a share of total employment for men and women, 2006 and 2011)*

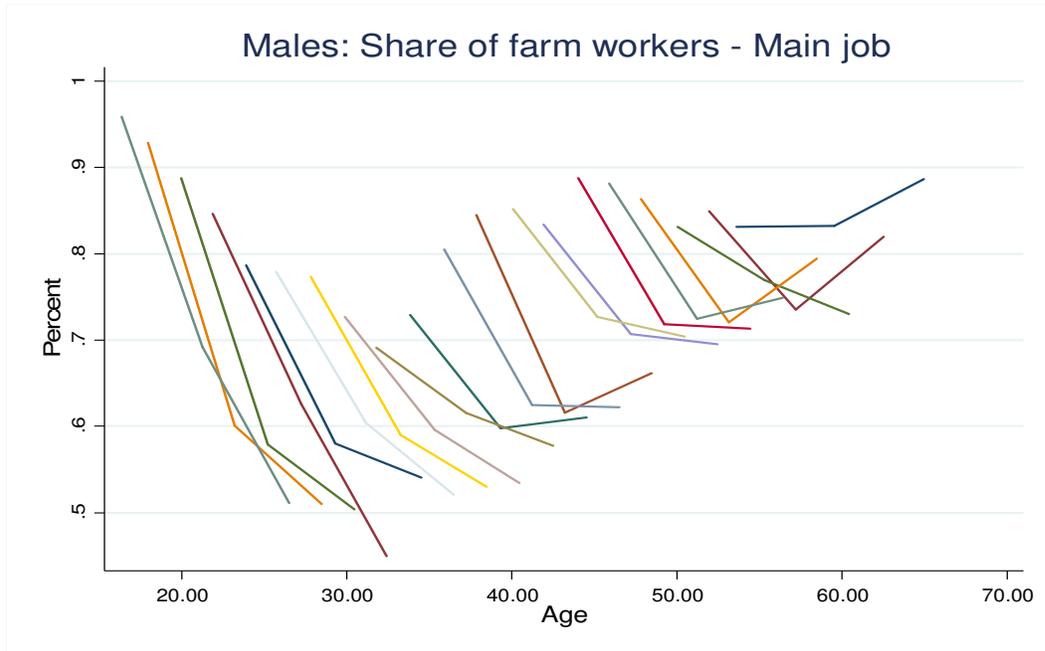
Type of employment	Women		Men	
	2006	2011	2006	2011
<b><i>Agriculture</i></b>	<b><i>85.4</i></b>	<b><i>81</i></b>	<b><i>67</i></b>	<b><i>58.1</i></b>
Independent farming	23.4	24.5	38.9	34.4
Unpaid family farm worker	54.5	45.7	16.8	10.6
Wage farming	7.5	10.8	11.3	13.1
<b><i>Non-agriculture</i></b>	<b><i>14.6</i></b>	<b><i>18.9</i></b>	<b><i>33</i></b>	<b><i>41.8</i></b>
Non-farm wage employment	6.1	8.5	20.6	28.4
Non-farm self-employment	5.3	6.8	9.4	8
Non-farm employer	0.3	2	1	4
Unpaid household enterprise worker	2.9	1.6	2	1.4

Source: EICV, 2006; 2011.

**Young men spearheaded the move to non-farm employment.** Figure 53 shows, for each cohort, the proportion of workers with their main job in agriculture in 2001, 2005, and 2011. Each line in Figure 53 follows the same cohort through time: the starting point of each line shows the proportion of the cohort with a main job in agriculture in 2001, while the middle and ending points of the same line shows the proportion of this same cohort who still had their main job in agriculture by 2006 and 2011, respectively. For the youngest cohort for example (the first line in Figure 53), who were 16 years of age in 2001, 95 percent had a main job in farming in 2001. This dropped to about 70 percent in 2006 (when the cohort was now 21 years old) and 50 percent by 2011 (when they were 26 years old). While main employment in agriculture decreased for all cohorts (except for the oldest cohort), the decrease was far more salient for the young<sup>19</sup>. While women also increasingly had their main employment outside farming, the magnitude of the shift was a lot smaller (see in Annex 3).

**Figure 53: Young men drive to move to non-farm occupations***(Share of cohort with main job in farming, 2001-2006-2011)*

<sup>19</sup> Note from Figure 14 that the shift to non-agricultural occupations was more salient between 2001 and 2006 than between 2006 and 2011.

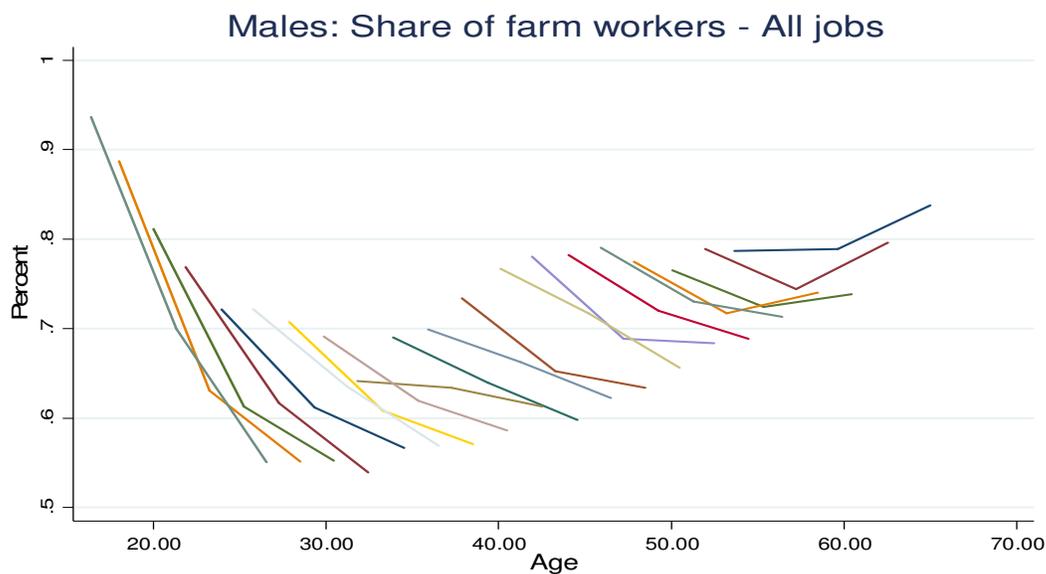


Source: EICV, 2001; 2006; 2011. World Bank staff calculations

**Looking at all jobs rather than just the main job, the principal finding is that agriculture is being abandoned by young cohorts of Rwandans.** The share of workers with a job in agriculture, regardless whether it is as a primary or secondary occupation, dropped off sharply since 2001 for the younger cohorts (Figure 12). The middle-aged cohorts however do not abandon agriculture but rather modify their engagement with the farm: While middle-aged workers (in their 40s and 50s) are substantially less likely than before to have their main job in farming (Figure 53), the share that does not work in agriculture at all only diminished modestly (Figure 12). The shift to non-farm employment as primary occupation is thus the result of two complimentary dynamics: First, young people are abandoning agriculture altogether and moving to non-farm occupations, while older workers increasingly shift their main occupation outside farming but keep a strong foot on the farm (as secondary occupation).

**Figure 54: Young men abandon agriculture, older men less so**

*(Share of cohort with a job in farming, 2001-2006-2011)*



Source: EICV, 2001; 2006; 2011. World Bank staff calculations

**Education and location are the main cohort characteristics correlated with the shift out of agriculture.** Higher educated cohorts are more likely to be in nonfarm jobs (see Annex 4). Estimates of a pseudo-panel regression show that a higher educational level (relative to cohorts with no schooling at all) is correlated with a larger ratio of nonfarm to farm jobs. The impact of education increases monotonically with the level of education and reaches a peak at secondary or higher education. Urbanization matters too: the larger the fraction of individuals living in urban areas in each cohort the higher the share of nonfarm jobs relative to farm jobs in that cohort. The lag of the proportion of nonfarm to farm jobs in each cohort has a positive effect indicating some degree of persistence. The larger the share of nonfarm to farm jobs in each cohort in year  $t$ , the larger that proportion is in year  $t+1$ . The move to nonfarm activities hence is likely to continue.

## 2.2 A changing employment structure within agriculture

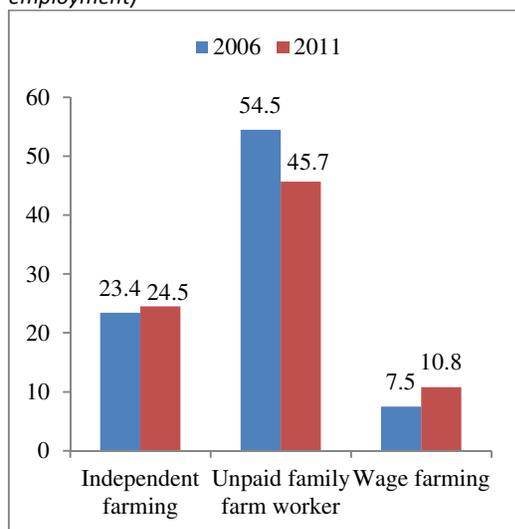
**Another salient evolution in Rwanda's jobs scene is the move towards wage employment in agriculture.** While unpaid family farming (household members working on the household farm without remuneration) dropped as a share of employment, from 38 percent in 2006 to 29 percent in 2011, the share of wage farming increased (Table 6). In absolute terms, independent family farming shed workers since 2006 (there were about 18,000 fewer workers in farm self-employment in 2001 than in 2006 - Figure 50), while wage farming recorded a strong increase (there were 190,000 more wage farmers in 2011 than in 2006).

**The agricultural dynamics differed between women and men.** For women, the declining share of unpaid family labor was to some extent compensated by the increasing share in independent farming and wage farming (Figure 55). For men, the declining share in unpaid family farming was accompanied by a decline in independent farming and a modest increase in wage farming (Figure 56). While the picture for men points towards a progressive diversification out of agriculture towards non-farm activities, women rather tended to shift occupations within agriculture.

Figure 55: A reallocation within agriculture for women

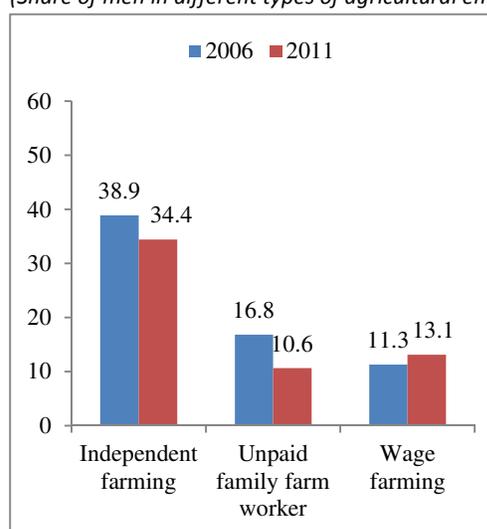
Figure 56: A moving out of agriculture for men

*(Share of women in different types of agricultural employment)*



Source: EICV, 2001; 2006; 2011.

*(Share of men in different types of agricultural employment)*



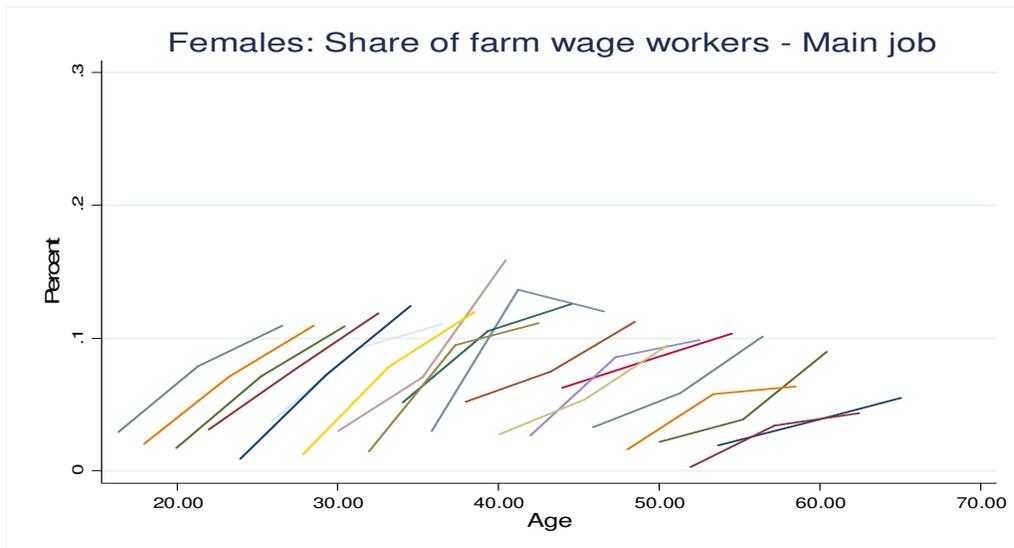
Source: EICV, 2001; 2006; 2011.

**The move to wage employment in agriculture is mainly driven by female youth.** For the younger cohorts, the share of women with a main job in farm wage employment increased substantially between 2001 and 2011 (steeply sloped lines in Figure 57). To illustrate, only about two percent of women in the cohort born in 1982/3 (second line in Figure 57) had their main job in farm wage employment in 2001. By 2011, this had increased to 12 percent<sup>20</sup>. For older cohorts, the lines are flatter, indicating a slower move towards farm wage employment for older women. While men also were more and more likely to engage in farm wage employment, the trend was less outspoken than for women and appears to have lost momentum with the second half of the decade (Annex 5).

**Figure 57: Female youth drive to move to agricultural wage employment**

*(Share of cohort with main job in wage farming, 2001-2006-2011 - females)*

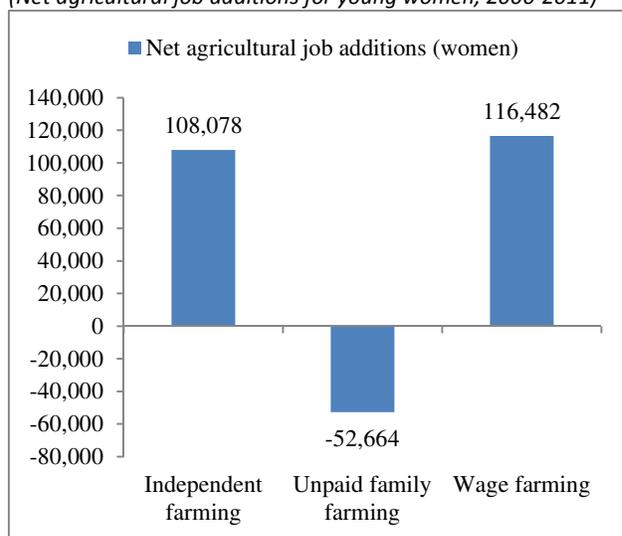
<sup>20</sup> For each line in Figure 57, the starting point of the line shows the proportion of women in the cohort with a main job in wage farming in 2001. The middle point of the line shows the proportion of women in that same cohort with a main job in wage farming in 2006, while the ending point of the line shows the situation in 2011.



Source: EICV, 2001; 2006; 2011. World Bank staff calculations

**Whether the move to farm wage employment has been positive or negative depends largely on where the young women were coming from (what they were doing before).** Looking at job dynamics between 2006 and 2011, there was a net decrease in young women working as unpaid farm labor and a net increase in young women working as independent farmers and agricultural employees (Figure 1). Although there are no panel data, this is consistent with female youth moving from unpaid family labor to paid farm labor (and to a somewhat lesser extent, independent farming). Given that unpaid family farmers are heavily underemployed on the family farm (see next section) and do not actually earn an income, the move to wage farming may have been important in pushing up aggregate household incomes.

**Figure 58: Young women move from unpaid to paid farming**  
*(Net agricultural job additions for young women, 2006-2011)*



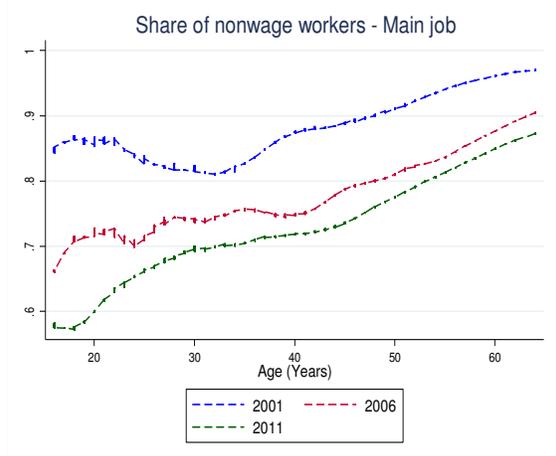
Source: EICV, 2006; 2011.

**The increase in farm wage employment seems to suggest a move towards a more commercial or market-oriented mode of agricultural production.** At the household level, the share of harvests that are sold on markets has increased steadily over the past decade, from 13 percent in 2001 to 21 percent in 2011. Also-although hard data on this are not available-the rollout of the policy of agricultural land use consolidation and regionalization since 2007/8 is believed to have increased the demand for farm wage labor due to drastically bigger harvests. Under the policy, called the Crop Intensification Program (CIP), farmers consolidate the use of their lands (to bring production to scale) and grow one single crop based on prevailing agro-ecological conditions. According to MINAGRI data, production of priority crops increased substantially following the rollout of the CIP<sup>21</sup>: Production of maize increased five-fold, that of wheat and cassava three-fold and production of beans and Irish potatoes doubled. Increased production may have increased demand for farm wage labor, which may have been a more attractive option for young women previously working as unpaid labor on the family farm.

**The move to wage employment was not confined to the farm sector.** The reduction in nonwage employment occurred across the board, with workers progressively embracing wage employment in both the farm and nonfarm sector. In terms of jobs, the shift has occurred gradually between 2001 and 2011 (Figure 60), whereas in terms of workers it was concentrated in the first half of the decade (Figure 59). Workers first moved to a wage job in their main activity and then gradually shifted to a wage type of relationship in non-primary activities. Though women also transitioned out of nonwage employment, the move to nonwage employment was larger among males and among youth (see Annex 5).

**Figure 59: The share of workers with a main nonwage job diminished sharply between 2001 and 2006**

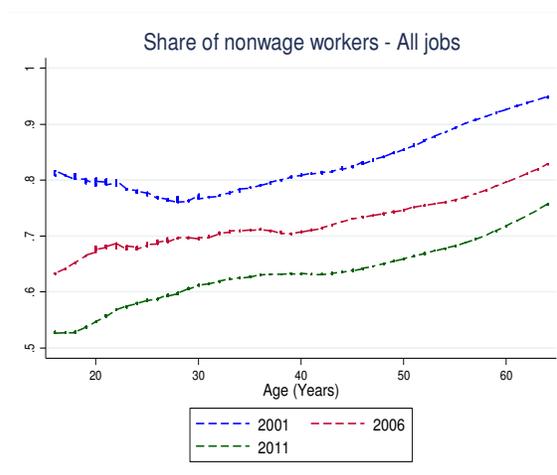
*(Share of workers with a main nonwage job. 2001-2006-2011))*



Source: EICV, 2001; 2006; 2011.

**Figure 60: The share of workers with a main nonwage job diminished sharply between 2001 and 2006**

*(Share of workers with a nonwage job. 2001-2006-2011))*



Source: EICV, 2001; 2006; 2011.

<sup>21</sup> Mbonigaba Muhinda and Dusengemungu,

**The figures so far hint at a disadvantaged employment position of women.** Looking at Table 7, women are four times more likely than men to have their main job in unpaid farming, and almost four times less likely to engage in non-farm wage employment as main occupation. Women are also less likely to be self-employed in the non-farm sector or to be employers. As a result, median earnings of women are almost 20 percent lower than those of men. The bulk of the earnings gap between men and women (77 percent) is unexplained by differences in characteristics. Rather, women have substantially lower returns to education and experience (age) than men do (that is, for similar age and education, women earn significantly less than men).

**Box 3**

**Education, discrimination, or cultural self-selection?**

*Whatever the reason, women’s position in the labor market is not enviable*

**Women in Rwanda are overrepresented in the lower-quality job categories.** 81 percent of women have their main job in agriculture, a comparatively low-productivity and low-earnings sector, compared to 58 percent of men. Within agriculture, women are more than four times more likely than men to be involved in unpaid family labor as main occupation. Overall, considering both the farm and the non-farm sector, 30 percent of workers in Rwanda have a main job as unpaid family worker. 84 percent of them are women.

**There is an obvious reason why women are underrepresented in better jobs: Education** Women are significantly less educated than men, which explains in part the underrepresentation in better job categories. However, focusing on the two youngest cohorts (16-25 years-old), young women still are worse off despite education levels similar to those as young men. Young women are 20 percentage points more likely than young men to have their main job in agriculture and are almost twice as likely to be engaged in unpaid family labor as main occupation (Figure 61). Controlling for the effect of education, young men are more than twice as likely to engage in non-farm wage employment compared to women. The underrepresentation of women in non-farm wage employment is especially salient in the formal private sector, where young women account for only 28 percent of jobs (Figure 62).

**Figure 61: Young women are more likely to have a main occupation in agriculture or as unpaid family worker**

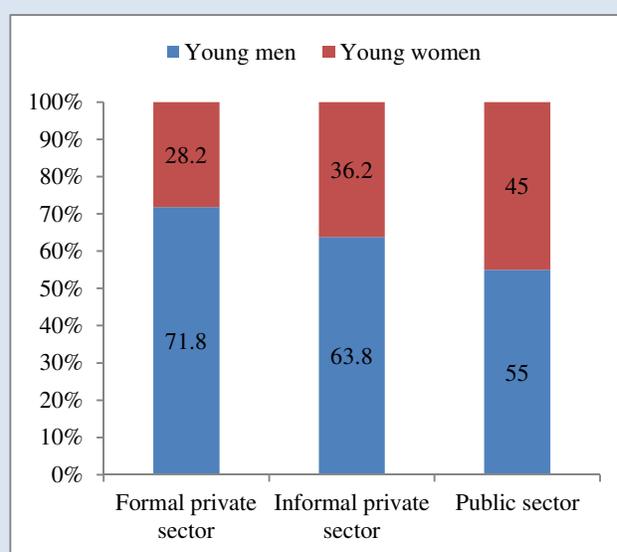
*(Share of youth 16-25 with main job in agriculture or as unpaid family worker, 2011 )*



Source: EICV, 2011.

**Figure 62: Young women are underrepresented in non-farm wage employment**

*(Share of young women and men in non-farm wage employment, by sector)*



Source: EICV, 2011.

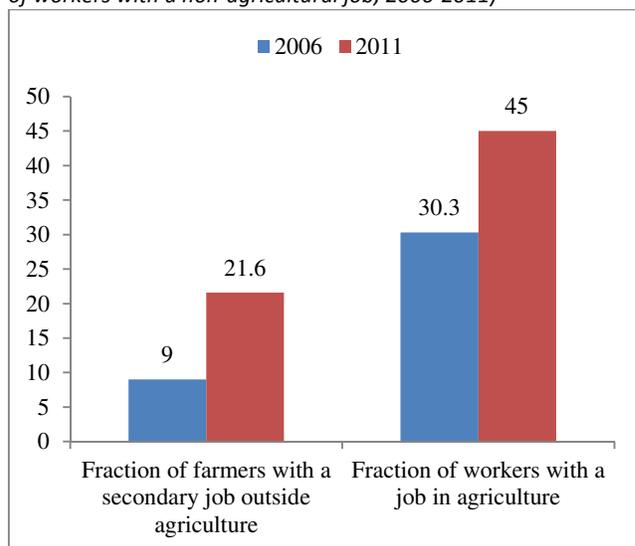
**For the young cohorts, the worse labor market position of women is not due to education.** Rather, it is possible that young women, for cultural reasons, self-select in agriculture or non-farm self-employment or face particular barriers in pursuing wage employment opportunities in the private sector. This can however not be tested with the available data.

### 2.3 Despite a take-up of additional jobs, underemployment is on the rise

**In 2011, 64 percent of workers in Rwanda had multiple jobs, up from 40 percent in 2006.** The increase in the share of workers with multiple jobs has particularly been salient for workers with a main job in agriculture. In 2006, workers with a main job in agriculture were a lot less likely to have several jobs than non-agricultural workers. By 2011, 63 percent of agricultural workers had multiple jobs, similar to non-agricultural workers (Table 8). Both men and women took up additional jobs between 2006 and 2011.

**Agricultural workers' uptake of additional jobs amounted in large part to a diversification into non-farm income-earning activities.** In 2006, only nine percent of workers with a main occupation in agriculture had a secondary occupation outside agriculture. By 2011, this had more than doubled to 22 percent. The move to non-farm occupations as a main job as documented in section 2.1 understates the true extent of the diversification into non-farm activities: Between 2006 and 2011, the share of workers with a job outside agriculture (regardless of whether this is a main or a secondary job) increased from 30 percent to 45 percent.

**Figure 63: Farmers are diversifying by taking up additional jobs**  
(Share of farmers with secondary job outside agriculture and share of workers with a non-agricultural job, 2006-2011)



Source: EICV, 2006; 2011.

**The uptake of additional jobs appears linked to the decline of working hours in the main job.** In 2006, the median worker worked 1,299 hours per year in his/her main job (25 hours a week based on 52 weeks a year). By 2011, this had declined to 18 hours a week (Table 8). Workers in occupations where hours worked in the main job decreased most were also most likely to take up additional activities: For agricultural workers, the median number of hours worked per week (in the main occupation only) decreased by 33 percent, and these workers were most likely to take up additional jobs (the share with multiple jobs increased by 26 percentage points - Table 8). Workers in non-farm occupations experienced a smaller decline in hours worked in the main job (19

percent), and were also less likely to take up additional activities. Based on the available data, it is not possible to determine whether the uptake of additional jobs among agricultural workers is due to push (shortage of land) or pull (increased availability of more lucrative non-farm employment opportunities) factors. However, given that non-farm occupations are typically higher-earning and more attractive than agriculture, the uptake of additional jobs outside agriculture likely reflects an increasing availability of non-farm opportunities<sup>22</sup>.

**Table 8: Hours worked in main job decreased across the board, but especially for agricultural workers**

*(% of workers with several jobs and median hours per week worked in main job, by main employment)*

Main employment	% of workers with several jobs		Median hours per week in main job		Percent change
	2006	2011	2006	2011	
<b>Agriculture</b>	<b>37</b>	<b>63.4</b>	<b>24.0</b>	<b>16.0</b>	<b>-33.4%</b>
Independent farming	35.7	61.3	20.0	16.0	-19.9%
Unpaid family farm worker	27.2	54.6	25.0	17.2	-31.1%
Wage farming	81	90.1	24.0	15.3	-36.2%
<b>Non-agriculture</b>	<b>51</b>	<b>64</b>	<b>32.0</b>	<b>26.0</b>	<b>-18.8%</b>
Non-farm wage employment	40	56.5	38.0	30.0	-21.1%
Non-farm self-employment	66.7	78.3	25.0	22.0	-12.0%
Non-farm employer	54.9	74.6	39.0	31.0	-20.4%
Unpaid household enterprise worker	47.4	67.3	26.0	20.0	-23.1%
<b>Total</b>	<b>40.3</b>	<b>63.6</b>	<b>25.0</b>	<b>18.0</b>	<b>-28.0%</b>

Source: EICV, 2006; 2011.

**Focusing on all jobs rather than on the main job only, overall hours worked decreased between 2006 and 2011.** The median number of hours worked in all jobs amounted to almost 26 hours a week in 2011, down from 29 hours in 2006 (Table 9)<sup>23</sup>. Workers with a main job in the non-farm sector work on average 16 hours a week more than agricultural workers. Non-farm employers and people with a wage job in the non-farm sector work the most hours, while independent farmers and unpaid family farmers only work 23 hours a week in all jobs together. The uptake of additional jobs has helped to compensate for the loss of hours in the main job, but not fully: Hours worked in the main job dropped by 28 percent between 2006 and 2011, while total hours worked dropped by 12 percent.

**Table 9: Weekly hours worked is substantially higher in the non-farm sector**

*(Median hours per week worked in all jobs, by main employment)*

<sup>22</sup> The recently concluded Rwanda Poverty Assessment identified the diversification into non-farm activities as a main driver of poverty reduction over the past decade, which adds credibility to the pull hypothesis.

<sup>23</sup> Differences in questionnaire design between the EICV2 and EICV3 may overstate the extent of the decline in working hours. In 2006, the respondents were asked for each month separately (over a 12-month period) whether or not they worked that month. In 2011, respondents were simply asked how many months (over a 12-month period, split by season) they had worked. Focusing only on the 7 days preceding the survey (a question that was comparable in EICV2 and EICV3), median hours worked amounted to 26 for EICV2 and 25 for EICV3. So while there has been a decrease in hours worked since 2006, the annual figures may overstate the magnitude of the decline.

Main employment	Median hours per week in all jobs		Percent change 2006
	2006	2011	
<b>Agriculture</b>	<b>26.2</b>	<b>23</b>	<b>-12.2%</b>
Independent farming	21.7	23	6.0%
Unpaid family farm worker	30	23	-23.3%
Wage farming	32.5	26.7	-17.8%
<b>Non-agriculture</b>	<b>39.6</b>	<b>38.7</b>	<b>-2.3%</b>
Non-farm wage employment	40	40	0.0%
Non-farm self-employment	36	29	-19.4%
Non-farm employer	48	44.6	-7.1%
Unpaid household enterprise worker	36	37.4	3.9%
<b>Total</b>	<b>29</b>	<b>25.6</b>	<b>-11.7%</b>

Source: EICV, 2006; 2011.

**Underemployment is a key feature of the labor market in Rwanda, and has worsened since 2006.** Next to the decrease in hours worked, and despite the uptake of additional jobs, time-related underemployment increased<sup>24</sup>: The fraction of employed persons who work less than 35 hours and wish to work more went from 34 percent in 2006 to 36 percent in 2011 (Table 10). The underemployment rate increased for all job categories. 42 percent of agricultural workers are underemployed, double the share of non-farm workers.

**Table 10: Underemployment increased since 2006 and is high across the board**

(Time-related underemployment rate, 2006 and 2011)

Main employment	Underemployment rate	
	2006	2011
<b>Agriculture</b>	<b>38.3</b>	<b>41.8</b>
Independent farming	33.9	38.8
Unpaid family farm worker	41.9	44.4
Wage farming	38.5	42.4
<b>Non-agriculture</b>	<b>18</b>	<b>21.3</b>
Non-farm wage employment	15.9	18.7
Non-farm self-employment	22.8	27.3
Non-farm employer	12.2	20.1
Unpaid household enterprise worker	21.6	27.7
<b>Total</b>	<b>33.6</b>	<b>35.7</b>

Source: EICV, 2006; 2011.

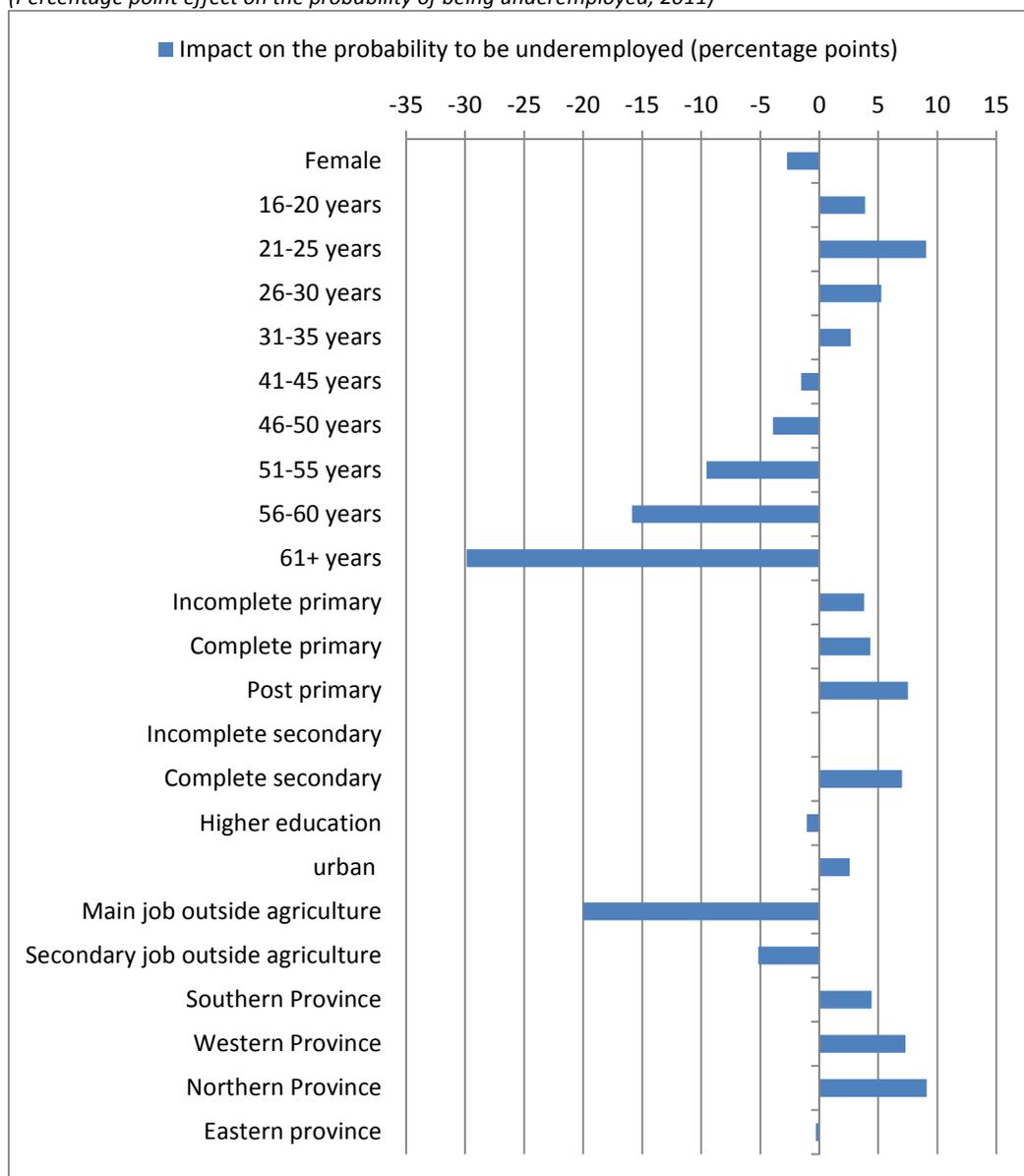
**Age, location, and occupation are the main correlates of underemployment.** Relative to prime-age workers (workers between 35 and 40-years-old), youth workers are more likely to be

<sup>24</sup> The labor statistics metadata handbook of Rwanda defines the time-related underemployment rate as the fraction of employed persons who work less than 35 hours a week but want to work more.

underemployed (Figure 64): Workers between 21 and 25-years of age are nine percentage points more likely to be underemployed, and this effect increases to 12 percentage points when excluding youths who are still in school. Workers with a main job outside agriculture are significantly less likely (20 percentage points) to be underemployed. For agricultural workers, taking up secondary jobs outside agriculture reduces the likelihood of being underemployment by five percentage points. Workers in rural areas are at higher risk of underemployment than workers in urban areas, in particular in the Northern and Western Provinces: All else equal, workers in the Northern (Western) Province are nine (seven) percentage points more likely to be underemployed than workers in Kigali. Women are somewhat less likely to be underemployed than men, and, relative to uneducated workers, workers who either completed post-primary education or secondary school are significantly more likely to be underemployed.

**Figure 64: Age, location and occupation are the main correlates of underemployment**

*(Percentage point effect on the probability of being underemployed, 2011)*



Source: EICV, 2011. Confidence intervals not shown because of large sample size (confidence intervals too small)

**The high underemployment rate means that a substantial part of available labor is currently left idle.** The 36 percent of workers that were underemployed in 2011 worked a median of 20 hours per week. According to the EICV3 survey, they would like to work an extra 21 hours per week. This means that underemployed workers wish to double the hours they currently work. Considering all workers, including those who are not underemployed, the average worker in Rwanda would like to work nine extra working hours per week, which would add 30 percent to current aggregate hours worked. The high underemployment rate precludes Rwanda from realizing its full output potential.

### 3. An increase in earnings from a low base

#### 3.1 Earnings increase across the board, though most in agriculture and for unskilled workers

**Individual labor earnings increased substantially since 2006.** Median earnings from all jobs increased by 66 percent between 2006 and 2011, and the share of workers with earnings below the poverty line (the low-earnings rate) decreased from 54 percent to 33 percent (Table 11). The increase in earnings happened despite the reduction in hours worked (as shown in Table 9, the median number of hours worked decreased from 29 in 2006 to 26 in 2011). As a result, hourly earnings increased sharply since 2006 (Table 11).

**Table 11: Jobs outcomes have improved between 2006 and 2011**

*(Earnings and job quality indicators, 2006 and 2011)*

	2006	2011	Difference
Median earnings	57,755.3	95,601.1	37,845.9
Median hourly earnings	41.9	76.2	34.3
Low earnings rate	54.2	33.2	-21.0
Poverty rates among low earners	68.9	55.0	-13.9
Share of low earners who have low earnings due to short hours	41.8	57.7	15.9
Share of low earners who work long hours	12.2	8.8	-3.4
Share of non-low earners who escape low earnings due to long hours	6.7	3.1	-4.9
Theil index for earnings	89.7	129.6	39.9
Gini coefficient for earnings	60.8	65.6	4.6

Source: EICV, 2006; 2011. Earnings are expressed on an annual basis in 2001 RwF and include earnings from all jobs.

**Low earnings are increasingly a consequence of underemployment.** While the low earnings rate has dropped, the share of low earners who have low earnings due to short hours (underemployment) increased between 2006 and 2011 (Table 11). In fact, of all low earners in 2011, 58 percent would not be low earners if they could increase hours worked. Low earnings are increasingly a consequence of underemployment rather than insufficient remuneration per unit of time: The share of workers who earn below the poverty line despite working long hours dropped

from 12 percent in 2006 to nine percent in 2011, and the share who only manage to escape low earnings by working long hours decreased from seven percent to three percent.

**Earnings increased across the board but most in agriculture.** Median earnings increased by 95 percent for independent farmers and by 50 percent for unpaid family farm workers and wage farmers (Table 12). The low earnings rate in agriculture dropped from 59 percent in 2006 to 37 percent in 2011. This is in line with the agriculture-driven poverty reduction as documented by the Rwanda Poverty Assessment. Earnings in the non-farm sector increased too: By 39 percent for wage employees and by 27 percent for the self-employed. Total earnings decreased for non-farm employers, due to the decrease in hours worked (earnings per hour actually increased). Overall, median hourly earnings doubled in agriculture and increased by half in the non-farm sector. Earnings remain however much higher in the non-farm sector than in farming (almost double).

**The increase in earnings may seem at odds with the high and increasing levels of underemployment, particularly in agriculture.** This apparent contradiction is explained by the strong increase in agricultural productivity since 2007/8 (see section 2.2) coupled with an increasing labor surplus in agriculture. The spike in agriculture productivity has increased household-level production and earnings, but the fact that employment in agriculture still grew in absolute terms put pressure on working hours and drove up underemployment. Given the scarcity of land, agriculture is increasingly unable to provide full-time employment to agricultural workers.

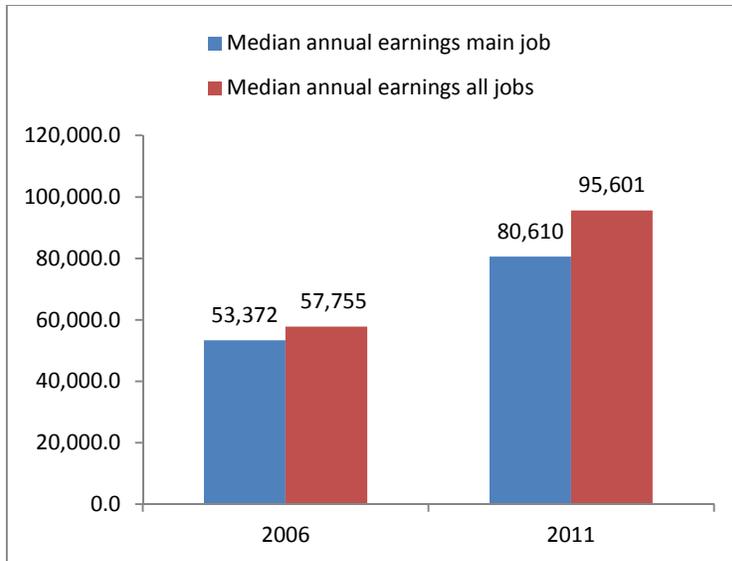
**Earnings from the main job increased by less than total earnings from all jobs.** Median earnings from the main job increased by 50 percent between 2006 and 2011, compared to 66 percent for total earnings (Figure 65). This suggests that the take-up of additional jobs observed between 2006 and 2011 has been important in boosting earnings and reducing the low earnings rate. While working several jobs is important to top up incomes, especially for low earners, its effectiveness as a strategy is nevertheless limited: Of all workers who are low earners based on the main occupation alone, 25 percent are no longer low earners when earnings from secondary jobs are taken into account. 75 percent of them however remain low earners.

**Table 12: Earnings increased across the board between 2006 and 2011***(Earnings and job quality indicators by employment type, 2006 and 2011)*

Employment type	2006	2011	Change
<b>Independent farmer</b>			
Median earnings	48,997.7	95,366.5	46,368.8
Median hourly earnings	45.5	85.4	39.9
Low earnings rate	60.1	31.3	-28.8
<b>Unpaid family farm worker</b>			
Median earnings	55,005.2	80,892.3	25,887.1
Median hourly earnings	38.9	72.9	34.0
Low earnings rate	57.0	39.7	-17.3
<b>Wage farm</b>			
Median earnings	50,703.9	74,051.2	23,347.4
Median hourly earnings	31.2	54.6	20.1
Low earnings rate	64.3	41.7	-25.8
<b>Wage nonfarm</b>			
Median earnings	114,857.5	159,514.7	44,657.2
Median hourly earnings	58.2	85.6	27.4
Low earnings rate	32.9	23.0	-9.9
<b>Nonfarm employer</b>			
Median earnings	261,595.7	253,925.4	-7,670.3
Median hourly earnings	119.4	130.1	10.7
Low earnings rate	22.8	16.2	-6.6
<b>Self-employed nonfarm</b>			
Median earnings	96,058.6	122,445.7	26,387.0
Median hourly earnings	55.6	73.6	18.0
Low earnings rate	37.4	28.2	-9.2
<b>Unpaid HH enterprise worker</b>			
Median earnings	53,820.7	130,627.0	76,806.3
Median hourly earnings	28.8	85.2	56.4
Low earnings rate	52.9	28.6	-24.3
<b>Agriculture</b>			
Median earnings	52,277.9	85,258.8	32,980.9
Median hourly earnings	39.2	73.4	34.2
Low earnings rate	59.1	36.6	-22.5
<b>Non-Agriculture</b>			
Median earnings	99,740.6	148,938.0	49,197.4
Median hourly earnings	55.6	84.8	29.2
Low earnings rate	38	25.2	-12.8

Source: EICV, 2006; 2011. Earnings are expressed on an annual basis in 2001 RwF and include earnings from all jobs.

**Figure 65: Earnings from secondary jobs increased substantially***(Median annual earnings from main job and from all jobs, 2006 and 2011)*

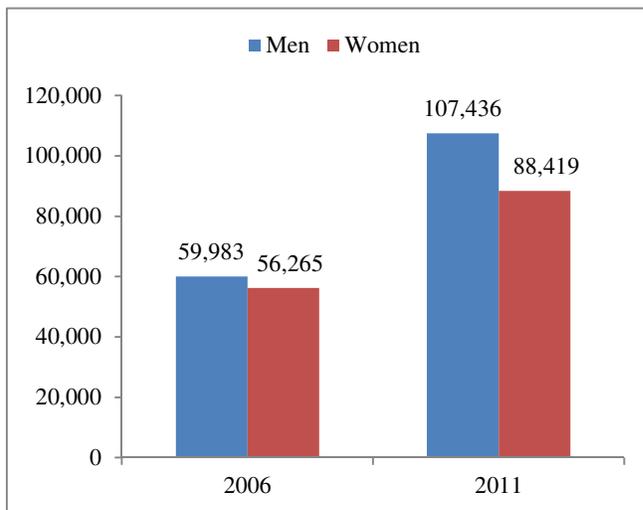


Source: EICV, 2006; 2011; Earnings in 2001 Rwf; World Bank staff calculations.

**The gap in earnings between men and women increased between 2006 and 2011.** Though earnings increased for women as well as for men, the increase was stronger for men, pushing up the earnings gap (Figure 66). The increasing earnings gap is consistent with women's relatively slower transition to better-paying non-farm occupations documented in section 2.1.

**Figure 66: The earnings gap between men and women increased since 2006**

*(Median annual earnings of men and women, 2006 and 2011)*



Source: EICV, 2006; 2011; Earnings in 2001 Rwf; World Bank staff calculations.

**Unskilled and low-skilled workers experienced the strongest increase in earnings.** Median earnings of uneducated workers increased by 80 percent while those of workers who completed primary education increased by half (Table 13). In contrast, earnings of workers with complete

secondary education decreased, albeit modestly. This is consistent with the earlier finding that earnings increased most in agriculture, where the low-skilled persons are likely to work. Education however continues to pay off: People who completed secondary earned twice as much (in 2011) than people who only completed primary, and people with higher education (completed or not) earned ten times as much as people who never entered school (Table 13)<sup>25</sup>.

**Table 13: Earnings increased most for unskilled workers**

*(Median earnings by education, 2006 and 2011)*

	2006	2011	% change
No education	47,383	84,853	79.1%
Incomplete primary	53,959	88,703	64.4%
Completed primary	70,873	108,888	53.6%
Post-primary	121,069	170,136	40.5%
Incomplete secondary	97,034	98,114	1.1%
Completed secondary	221,486	215,712	-2.6%
Higher	817,714	863,235	5.6%

Source: EICV, 2006; 2011. Earnings are expressed on an annual basis in 2001 RwF.

**Defining workers with at least post-primary education as “skilled” workers, the skills premium decreased between 2006 and 2011.** The skills premium—the ratio of skilled to unskilled earnings, which can be considered as the relative price of skills—fell from 2.9 to 2.0. This means that the median skilled worker earned twice as much as the median unskilled worker in 2011, whereas in 2006, the median skilled worker would earn three times as much. The decrease in the skills premium is however not due to decreasing returns to higher levels of education, though rather to the sharp increase in earnings among unskilled workers: Median earnings for unskilled workers increased by 67 percent between 2006 and 2011, and skilled earnings increased by 18 percent. The latter point is important: Though the supply of skills increased (the share of skilled workers increased by 20 percent), the price of skills increased too, pointing towards a lack of skills in the economy and sustained high demand for skilled workers, outpacing its supply.

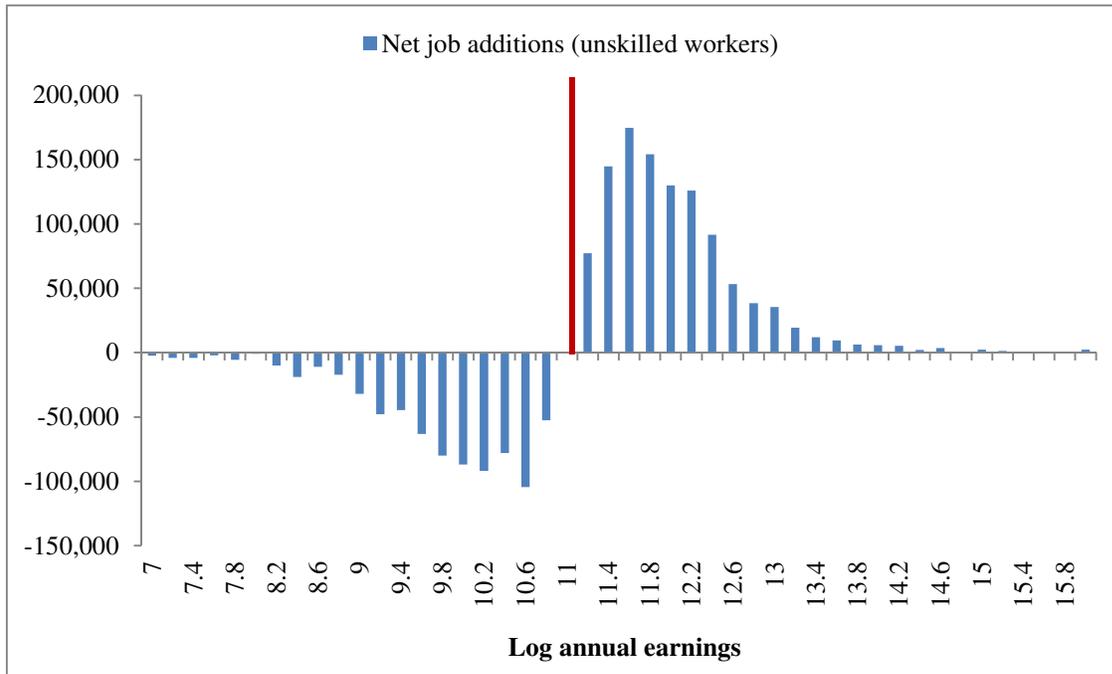
**To examine in more detail the earnings dynamics of skilled and unskilled workers, Figure 67 and Figure 68 plot the net skilled and unskilled job additions (actually: worker additions) across the earnings spectrum.** In the unskilled sector (Figure 67), there was a net loss of low-earning jobs (workers) between 2006 and 2011 and a net increase in jobs earnings above the 2006 unskilled median (red line depicts 2006 median earnings for unskilled workers). In the skilled sector, the picture is more nuanced (Figure 68): While most of the skilled workers added since 2006 earn above the 2006 skilled median (explaining the overall increase in earnings for skilled

<sup>25</sup> This is consistent with the findings of Montenegro and Patrinos (2014), who find that returns to education in Rwanda are the highest among the 139 countries in their study (Montenegro, C. and Patrinos, H. (2014). “Comparable Estimates of Returns to Schooling Around the World.” *Policy Research Working Paper 7020*. Washington DC: The World Bank). Based on Mincer regressions, World Bank (2013) also finds high returns to education in Rwanda, especially at the senior secondary and tertiary level. Controlling for age, location and education, there are high returns to being male, and controlling for education, sex and age, urban workers earn significantly more than rural workers (World Bank. (2013). *Post-Basic Education and Training in Rwanda. Skills Development for Dynamic Economic Growth*. Washington DC: The World Bank).

workers), a non-negligible fraction of the net skilled job additions earn below the 2006 median. Most of the skilled job additions below the 2006 skilled median however still earn above the 2006 unskilled median.

**Figure 67: New unskilled jobs earn more than the 2006 median**

*(Net unskilled job additions across the earnings distribution, 2006-2011)*

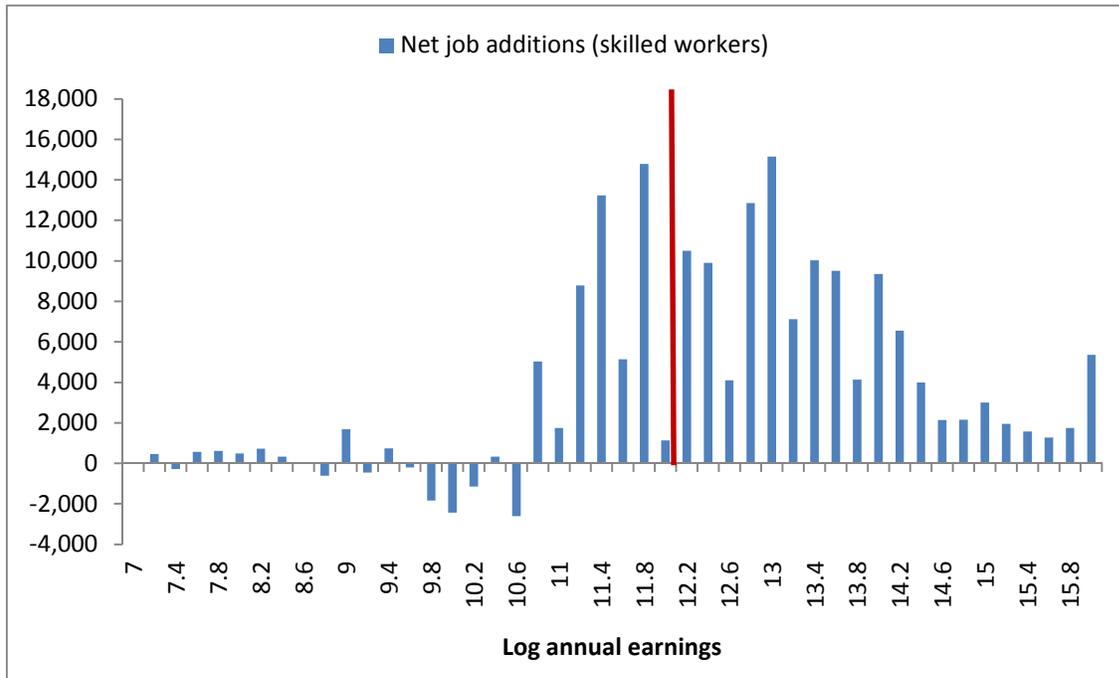


Source: EICV, 2006; 2011. Vertical red lines denote 2006 median earnings for unskilled workers.

**Figure 68 suggests a high demand for skills.** Skilled employment grew by 50 percent between 2006 and 2011 (compared to 11 percent for unskilled employment) and the number of high-paying skilled jobs (towards the right-hand-side of Figure 68) continued to grow. This is suggestive evidence that demand for highly-paid skilled labor is continuing to grow, that there is a lack of skills in the economy, and that the decline in the skills premium is driven by the sharp decrease in low-earning unskilled workers. The shortage of skills in the economy is expected to ease in the short to medium run as the recent expansion in education will start paying off.

**Figure 68: Most new skilled jobs earn more than the 2006 skilled median**

*(Net skilled job additions across the earnings distribution, 2006-2011)*



Source: EICV, 2006; 2011. Vertical red lines denote 2006 median earnings for skilled workers.

### 3.2 Diversification and take-up of additional jobs important for the earnings increase

**Although an in-depth analysis of what determines earnings in Rwanda is outside the scope of this report, it is nevertheless informative to briefly touch upon the correlates of the growth in earnings.** Here, we use a number of decomposition approaches to get a better idea of the mechanism behind the observed increase in earnings. At the outset, it is important to keep in mind that the following decompositions are descriptive and do not necessarily represent causal effects.

**Given the short time frame between the surveys (five years), it is not surprising that changes in the characteristics of the workforce and the jobs they are doing explain only a small part of the increase in earnings.** Using an Oaxaca-Blinder decomposition, we find that the changes in the characteristics of the workforce and the jobs they are doing explain only a minor part (about 22 percent) of the increase in median earnings<sup>26</sup>. The workforce characteristic that has been most strongly correlated with the increase in median earnings is the increasing share of workers with a job outside agriculture: The share of workers with a job outside agriculture (regardless of whether

<sup>26</sup> This means that most of the increase in earnings remains “unexplained”, or due to changes in returns (coefficients).

or not this is the main job) increased from 30 percent in 2006 to 45 percent in 2011, explaining about 12 percent of the growth in median earnings (Figure 69). The modest increase in education of the workforce and the higher share of workers working several jobs only had a small positive impact on earnings.

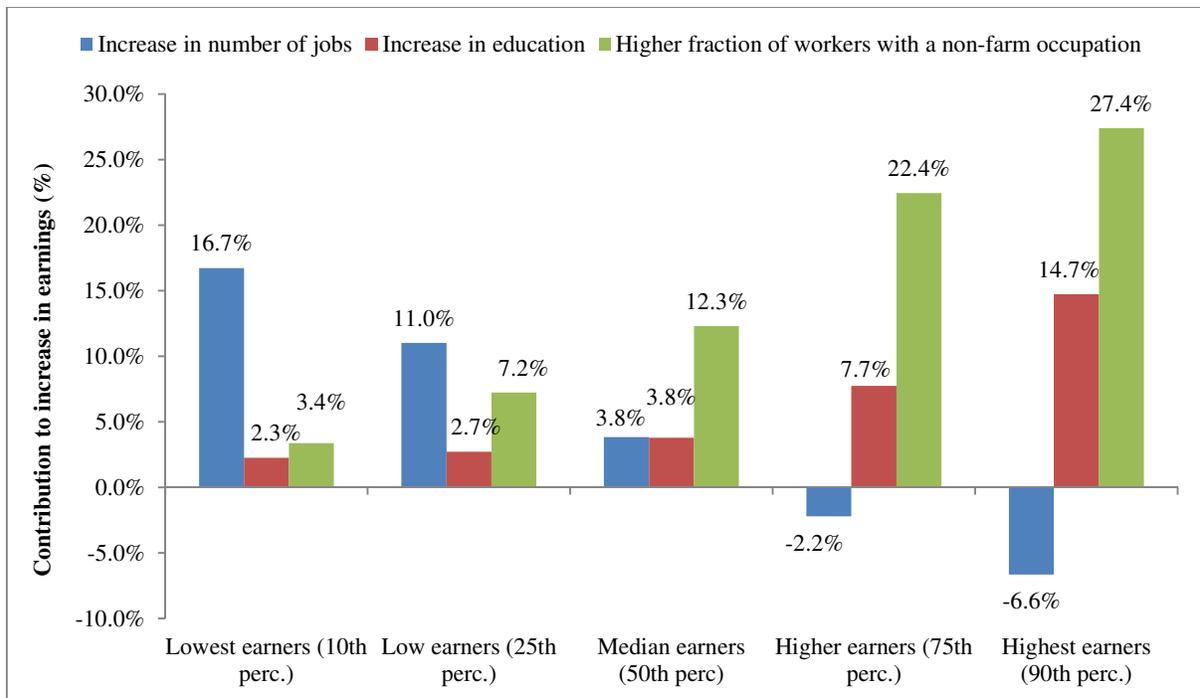
**There are a number of interesting differences in the correlates of earnings growth between lower- and higher-earning workers.** Taking up additional jobs has been particularly important for earnings growth of low-earners: Taking on additional jobs explains 17 percent of growth in earnings at the 10<sup>th</sup> percentile and 11 percent at the 25<sup>th</sup> percentile, but was only of marginal importance at the median and even negatively correlated with earnings growth of higher-earners (Figure 69). Though low-earners also diversified into non-farm activities, this has not been associated with growth in their earnings. In contrast, diversification accounts for the bulk of earnings growth at the higher end of the distribution: The higher share of workers with a non-farm occupation explains 27 percent of earnings growth at the 90<sup>th</sup> percentile and 22 percent at the 75<sup>th</sup> percentile. The increase in education between 2006 and 2011 contributed significantly to earnings growth for the higher earners (15 percent at the 90<sup>th</sup> percentile and 8 percent at the 75<sup>th</sup> percentile), but was only marginal at the lower half of the earnings distribution (Figure 69)<sup>27</sup>. As a footnote, growth in earnings has been pro-poor between 2006 and 2011: Earnings increased by 65 percent at the 10<sup>th</sup> percentile and 57 percent at the 25<sup>th</sup> percentile, compared to 43 percent at the 75<sup>th</sup> and 90<sup>th</sup> percentiles.

**Figure 69: Taking up additional jobs was a main correlate of earnings growth for low earners, while diversification was more important for higher earners**

*(Contribution to growth in earnings at different points of the earnings distribution)*

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<sup>27</sup> Repeating the analysis with the move to non-farm occupations split into two variables depending on the status of the non-farm occupation (primary job or secondary job) broadly gives the same results: The move to non-farm occupations as a main job is the main correlate of earnings growth at the higher end of the distribution, while the take up of non-farm secondary occupations was more important at the lower end of the distribution (where the uptake of additional jobs in general remains the main driver of earnings growth).



Source: EICV, 2006; 2011; World Bank staff calculations.

**Although diversification into non-farm occupations has contributed to the observed growth in earnings, most of the decrease in the low earnings rate can be accounted for by increased earnings within sector.** Considering the broad agricultural vs non-agricultural dichotomy, 89 percent of the decrease in the low earnings rate between 2006 and 2011 can be accounted for by increased earnings within sectors, in particular in agriculture. An additional 17 percent can be explained by the uptake of non-agricultural jobs (regardless of the status of that job-primary or secondary). The interaction effect is negative: workers took up jobs in the sector where earnings increased least (the non-farm sector). The decrease in the low-earnings rate is predominantly due to increased earnings within agriculture, related to the increase in agricultural production and productivity since 2007/8.

#### 4. Conclusions

**The past decade has witnessed a substantial transformation of the jobs landscape in Rwanda.** Workers are increasingly moving to nonfarm activities, with the share of agriculture as main employment falling from 90 percent in 2001 to about 70 percent in 2011. Within agriculture, the structure of employment has changed, with farm wage employment becoming more important and independent farming and unpaid family farming losing employment share. The move to wage employment is not confined to the farm sector: Overall, wage employment increased from 22 percent in 2006 to about 30 percent 2011, up from a mere 11 percent in 2001. In line with this, non-waged employment, although still the dominant form of employment in Rwanda, is decreasing.

**Youths have been the engine of change in Rwanda's employment landscape.** Youth, and especially young men, are leading the move to non-farm employment, while young women in particular are abandoning unpaid family farming to move into wage farming. The nature of the move to nonfarm employment differs for youth and adults. While more and more youth abandon

agriculture altogether, older workers are changing their engagement with agriculture, shifting their primary employment to the non-farm sector but retaining a strong foot in agriculture as secondary occupations. The move to nonfarm employment is likely to continue: As secondary education and urbanization are the main drivers of the move to nonfarm employment, the move can be expected to pick up given the expanding access to education in Rwanda and the Government's plans to spur urbanization.

**The jobs transitions over the past decade have been accompanied by a steep increase in earnings from a low base.** The proportion of workers earning below the poverty line dropped from 54 percent in 2006 to 33 percent in 2011, with particularly sharp drops in agriculture. The uptake of additional jobs has been an important driver of the earnings increase for low earners, while the move to nonfarm occupations has particularly been important at the upper half of the earnings distribution. While the uptake of nonfarm jobs has certainly been important for the earnings increase, most of the increase was driven by improvements within sectors, notable agriculture. This again underscores the crucial importance of agricultural productivity improvements for poverty reduction.

**Despite the positive evolutions, steep challenges persist.** Earnings remain low, with 50 percent of workers earning Rwf 18,175 per month or less and one third of workers earning below the poverty line. Underemployment, already pervasive in 2006, has become even more widespread, up to the point that 36 percent of Rwandan workers are in time-related underemployment. The emerging picture is one of a labor market gradually evolving towards a more modern labor market, but increasingly unable to provide full time employment to the rapidly expanding labor force.

## Chapter 3. The profile of nonfarm enterprises and jobs

### 1. Introduction

**The previous chapter looked at the employment profile and earnings of workers in Rwanda using the EICV household surveys.** In this chapter, we use data from the 2011 Establishment Census (henceforth EC), which provides information on 127,662 formal and informal firms in Rwanda. We start by looking at where the off-farm jobs are located in Rwanda, the characteristics of the firms that create them and at the education, gender and nationality of the workers employed. The chapter then uses enterprise<sup>28</sup> age data to provide insights into recent jobs dynamics, looking at which firms are creating jobs where. Important questions include whether the investment climate encourages or discourages entry and expansion of particular firms, and whether the recent pattern of hiring in terms of skills demand matches the improvement in education amongst the new entrants to the workforce. Finally using spatial data and maps, we investigate whether the dynamics and spatial and product patterns of business entry and job creation suggest particular priorities for public investments.

**At the outset of this chapter, it is important to note a number of caveats.** First, the analysis is based on one singly cross section of establishments (the 2011 census), which means that the analysis cannot address the dynamics of firm or job survival and destruction or growth of firms over time<sup>29</sup>. As a result, the analysis in this chapter is rather descriptive. Second, employment in established firms is only small fraction of overall employment in Rwanda. According to the EICV3 survey, 4.9 million people in Rwanda were employed in 2011 (see in Chapter 2). The 127,662 firms included in the establishment census provide employment to only 280,000 persons, underscoring the small size of the non-farm private sector. This means that the analysis in this chapter only covers six percent of the employed workforce in Rwanda<sup>30</sup>.

### 2. The profile of non-farm work in enterprises in Rwanda

**The vast majority of workers<sup>31</sup> in established firms in Rwanda are employed in recently-created micro enterprises.** Micro enterprises, defined as establishments with at most three

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<sup>28</sup> The analytic report uses as standard definition of enterprises: “Enterprises are defined broadly to refer to units employing hired labour or those operating with single individuals or with the help of unpaid family members. Economic activity may occur inside or outside the enterprise owner’s home, at identifiable or unidentifiable premises, or without a fixed location (ILO, 2004)”.

<sup>29</sup> In 2008, the Private Sector Federation conducted a census of 72,994 firms in Rwanda. Unfortunately, the raw data have been lost.

<sup>30</sup> In contrast to the EICV surveys, the Establishment Census did not cover the smallest most informal household enterprises that are “hidden” within the household (have no premises). Also, the Establishment Census did not include street vendors, taxis and motor drivers, roads and buildings construction sites, and temporary booths. This explains the difference between non-farm workers according to the EICV and non-farm workers according to the establishment census.

<sup>31</sup> 3 percent of firms in Rwanda’s Establishment Census did not report the number of their employees. Most of these firms are recorded in the census as ‘closed permanently’ and given the sector code “activities of extra-territorial units”. For the purpose of this chapter’s analysis, these firms are excluded. A further 7,000 firms did not report their age. They are included in employment analysis but excluded from the analysis of enterprise age.

workers, represent 92.6 percent of firms and 51.6 percent of jobs<sup>32</sup> (Table 14). Women, although a smaller share of the workforce, are slightly more likely to work in larger firms on average, with 48 percent of women working in micro firms compared with 53 percent of men (Table 14). Most establishments in Rwanda are young: 79 percent of established firms in the 2011 census started operating after 2006, with half of Rwanda’s established firms starting in the last two years (Figure 70)<sup>33</sup>.

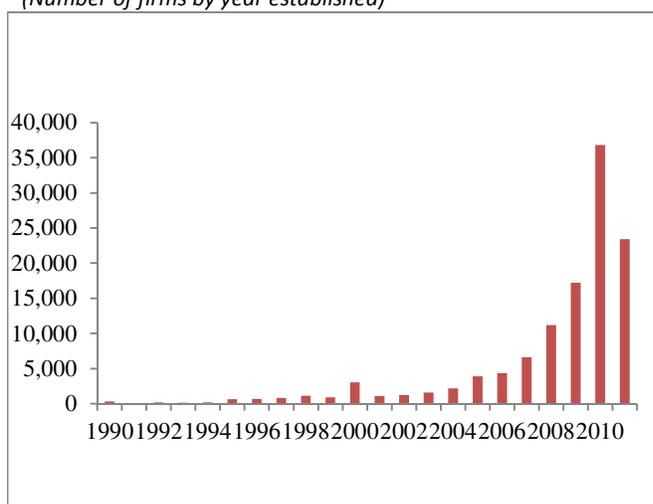
**Table 14: Micro-enterprises dominate**

		Firms	Employees	Males	Females
Large	>101	0.1%	15.6%	14.2%	18.3%
Medium	31-100	0.4%	8.7%	8.4%	9.1%
Small	4-30	6.9%	24.2%	24.1%	24.3%
Micro	1-3	92.6%	51.6%	53.2%	48.3%

Source: Establishment Census, 2011.

**Figure 70: Rwandan establishments are young**

(Number of firms by year established)



Source: Establishment Census, 2011.

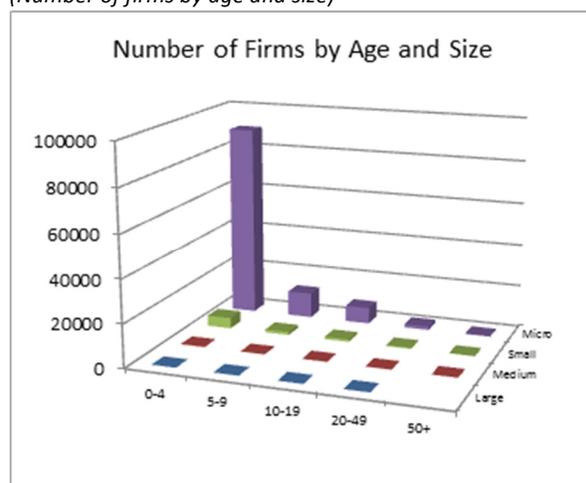
**Given that the majority of firms are young, the bulk of jobs in establishments was created in recent years.** The lion’s share of jobs was created by micro-firms between 2007 and 2011 (Figure 72). Job creation through new firm entry was however not restricted to micro firms. Further scrutiny shows that new Rwandan-owned large and medium firms were established in ‘growing of beverage crops’ (tea and coffee), the manufacture of building materials, and in a variety of other manufacturing products. Firms in these traded goods accounted for half of all new jobs in large

<sup>32</sup> These size categories take Rwanda’s definitions based on employment, not international definitions.

<sup>33</sup> In the absence of panel data, the youthfulness of Rwanda’s firms can be interpreted in several ways: Either the business and economic climate has improved so much in recent years that many firms have opened shop, or longevity of firms is low, creating a bias towards young firms. Just before the establishment census, in 2009, Rwanda established a one-stop shop for business registration, resulting in a sharp increase in the number of businesses registered (<http://blogs.worldbank.org/impacetevaluations/evaluating-regulatory-reforms-using-the-synthetic-control-method>). This may explain the spike in 2009.

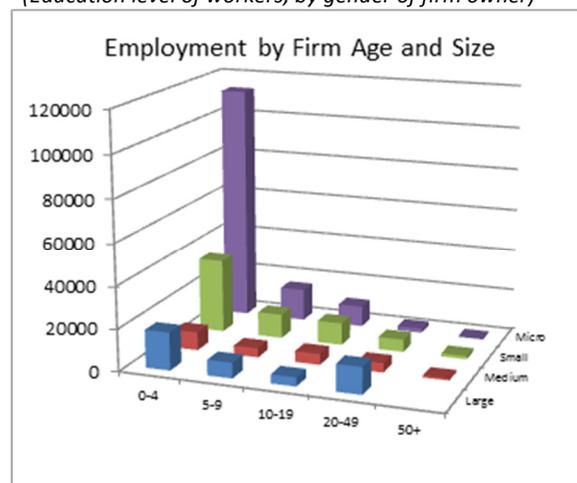
and medium sized firms. So whereas most firms and jobs are in small and micro enterprises, a good share of the jobs created in larger and medium sized firms were in traded goods.

**Figure 71: Micro-firms account for the bulk of new firms**  
(Number of firms by age and size)



Source: Establishment Census, 2011.

**Figure 72: And their workers tend to be more educated**  
(Education level of workers, by gender of firm owner)



Source: Establishment Census, 2011.

**The informal sector dominates.** In Rwanda’s census, to be classified as “formal”, an establishment must: (a) be registered with Rwanda Revenue Authority (RRA) and, for smaller companies with fewer than five employees, maintain regular operational accounts. By this definition, 95 percent of all firms operating in Rwanda are informal, and this rises to 97 percent for the micro firms. Informality is however not restricted to micro-firms: 28 percent of large firms and 39 percent of medium firms in Rwanda are informal according to the official definition. Overall, 72 percent of workers in enterprises in Rwanda are working in informal firms (Table 15), with the remaining 28 percent working in formal sector establishments.

**Table 15: Not only micro-firms are informal**  
(Informal sector shares by firm size)

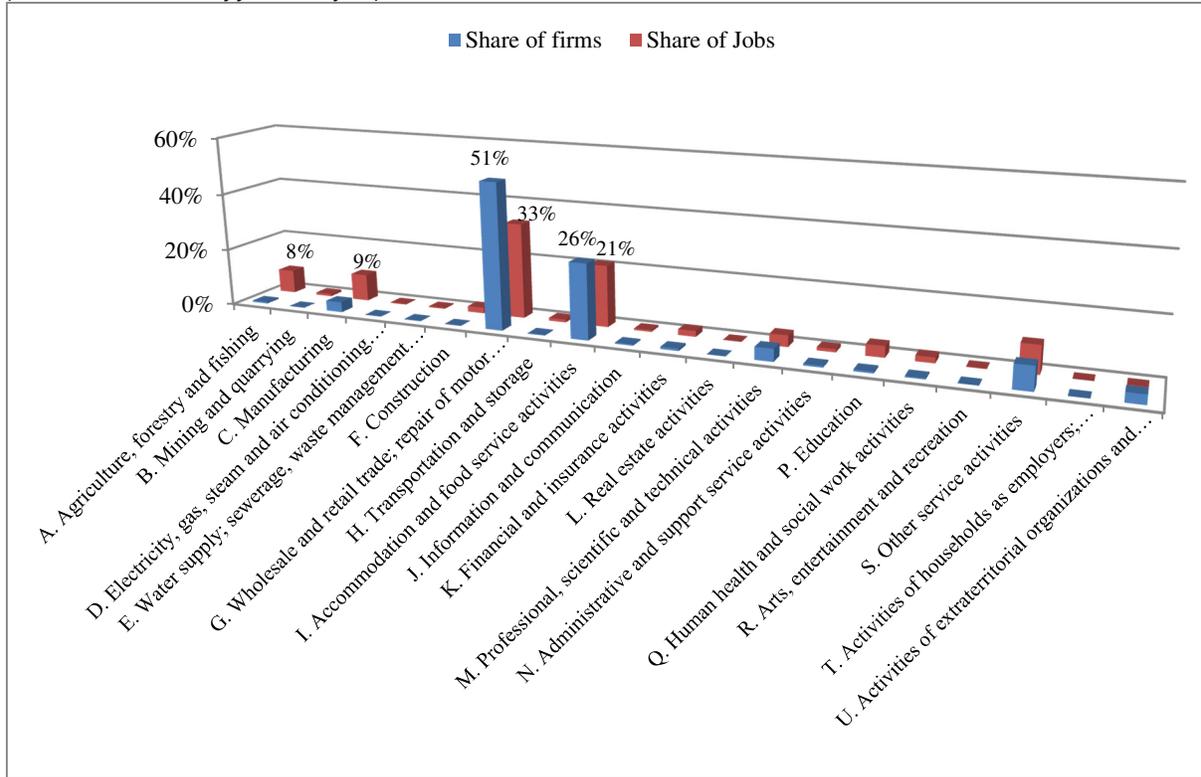
Firm size	% of firms informal	% of employees informal	Males	Females
Large	28	28	19	41
Medium	39	40	36	48
Small	68	61	61	62
Micro	97	96	96	94

Source: Establishment Census, 2011.

**The bulk of firms and jobs are in the service sector.** Over half of firms (51 percent) are in wholesale or retail trade, and 26 percent are in hotels and restaurants (Figure 73). Services account for a higher share of establishments than jobs, owing to the smaller size of service establishments (for instance, wholesale and retail account for 51 percent of firms but only 33 percent of jobs). Agriculture and manufacturing make up a significant share of jobs (17 percent), despite only

accounting for 5 percent of firms. Almost one third of all jobs in agriculture and manufacturing are in the Western Province, in coffee and tea growing cooperatives and in factories.

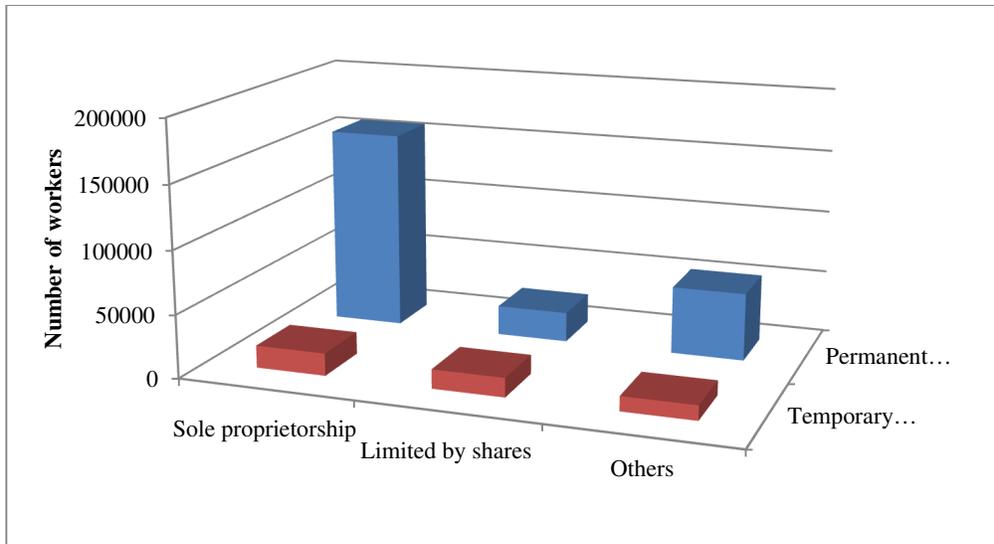
**Figure 73: Wholesale and retail trade and hotels and restaurants account for bulk of firms and jobs**  
(Sectoral distribution of firms and jobs)



Source: Establishment Census, 2011.

**Few firms, in particular among micro and small firms, hire temporary employees.** Temporary work is however a significantly higher share of work in large private limited companies in specific products categories. Only 9 percent of informal firms hire temporary workers, whereas one third of formal firms' employees are reported as temporary workers. Amongst large firms, temporary work is most common in mining (86 percent of employees are temporary), agriculture (77 percent), and construction (67 percent). Temporary work is most common for women, and one third of all temporary work is in the 4-digit ISIC4 category 0127 'growing of beverage crops' (mainly women plucking tea and coffee). Other common temporary jobs are in restaurant and food serving, and in bars and beverage vendors, whilst sugar manufacturing is another significant source of temporary work.

**Figure 74: Large firms have more temporary workers**  
(Number of workers by tenure of work and firm type)

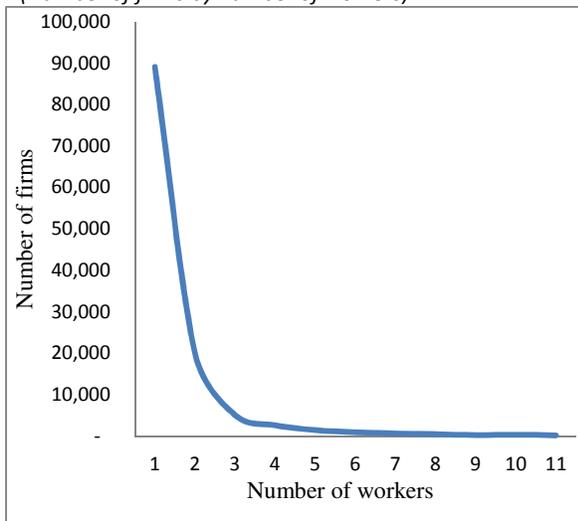


Source: Establishment Census, 2011.

**The size categories in Table 14 might suggest a 'missing middle' in the medium firm size category.** There is however no evidence that either formal or informal firms are bunched around a size threshold. This is an important point because, as noted by Tsieh and Olken (2014)<sup>34</sup>, if the tax code, regulatory environment, or the risk of exposure to corruption was a severe constraint to business expansion, firms would cluster at sizes below the threshold that these negative investment climate factors kick-in. Detailed scrutiny of the size distribution of firms (Figure 75 and Figure 76) shows that there is no obvious bunching of firms or employment around a particular size threshold of firms. That is, there does not appear to be any particular advantage to maintaining a small operating size.

**Figure 75: Micro or small firms are not bunched at specific employment thresholds...**

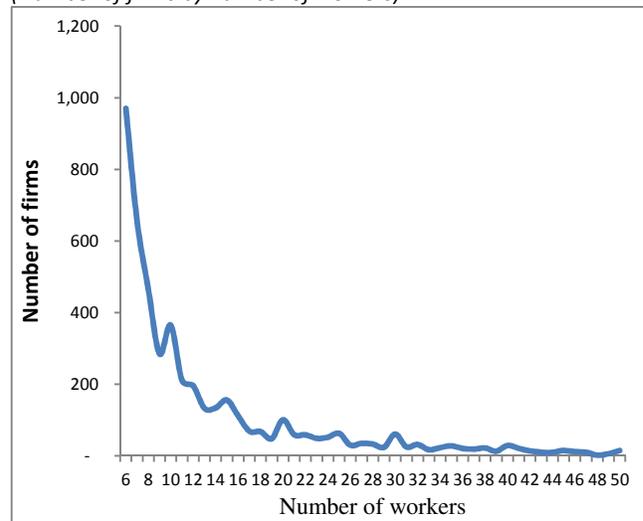
(Number of firms by number of workers)



Source: Establishment Census, 2011.

**Figure 76: Nor are firms with six to 50 workers**

(Number of firms by number of workers)

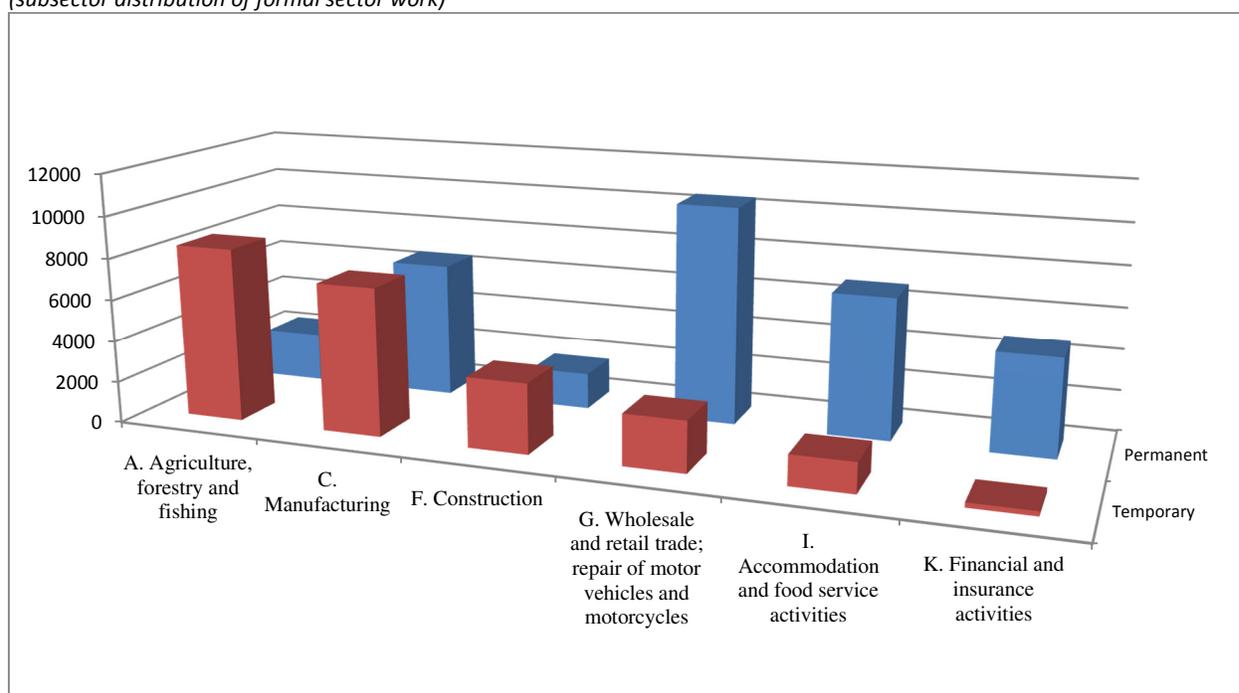


Source: Establishment Census, 2011.

<sup>34</sup> Tsieh and Olken (2014), "The Missing "Missing Middle"", Journal of Development Perspectives, June 2014.

**Within the formal sector, ignoring health and education services, the most important sectors for waged jobs are retail and wholesale trade, manufacturing and agriculture.** Waged employment in the formal sector (though small) is quite broadly spread across sectors (Figure 77). Tradeables tend to offer more temporary work, while permanent work is more likely in smaller firms in service sectors (trade, hotels and restaurants). Together the six sectors in Figure 77 account for 71 percent of waged jobs in formal sector enterprises. At the 4-digit product level, just 10 products account for half of employment in formal established firms (Figure 7). Growing of beverage crops (tea and coffee), at 13 percent of jobs in formal establishments, is the most important formal job-creating activity, followed by “manufacturing of other food products” which includes tea and coffee processing (8 percent). Other financial intermediation and secondary education come next with 5 percent each.

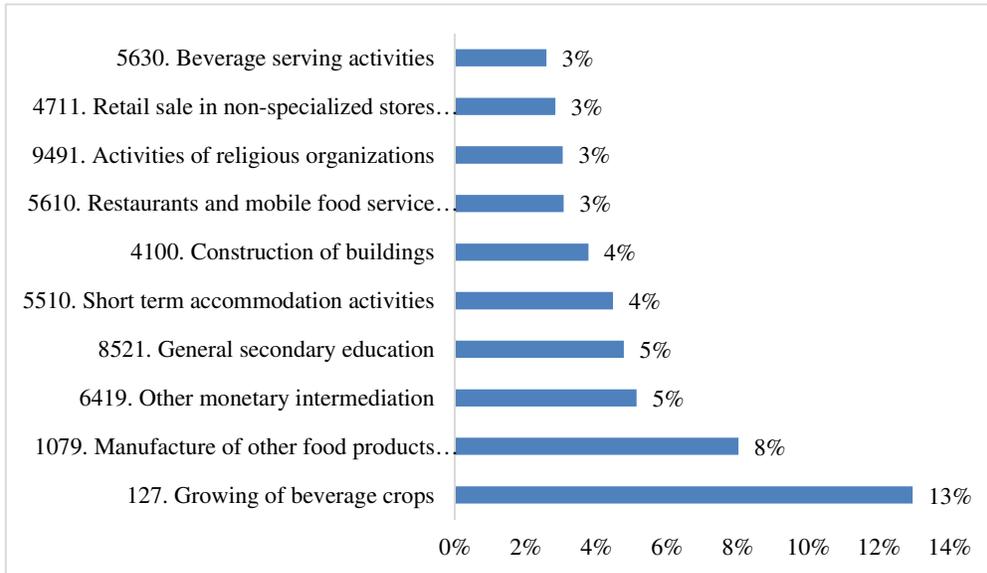
**Figure 77: Trade, hotels and restaurants account for the bulk of permanent employment in formal firms**  
(subsector distribution of formal sector work)



Source: Establishment Census, 2011.

**Manufacturing and agriculture account for about half of jobs in the formal sector, though most of these jobs are temporary.** Manufacturing and agriculture account for 48 percent of all formal sector jobs, though only 30 percent of permanent jobs. Overall, permanent employment in medium and large formal sector firms is small, owing to the fact many of the large and medium formal firms are cooperatives operating in tea and coffee growing and processing, which mainly provide temporary employment.

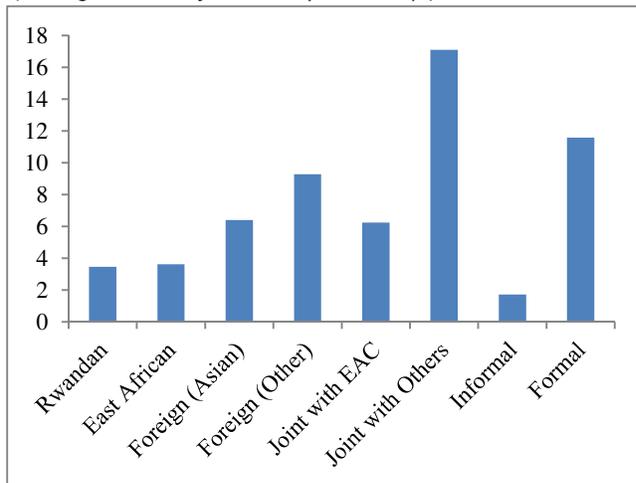
**Figure 78: Coffee and tea provide most employment in formal-sector establishments**  
(Employment share of top 10 products in formal establishments)



Source: Establishment Census, 2011.

**Foreign owned firms are few and account for a small share of total jobs.** In 2011, there were only 915 foreign establishments operating in Rwanda, representing less than 1 percent of all firms and 4.5 percent of total employment. Foreign or jointly foreign and Rwandan firms tend to be larger (Figure 79), older, and twice as likely to be located around Kigali. 56 percent of foreign firms are located in Kigali, compared to 27 percent of Rwandan firms. Only 58 of foreign firms are in manufacturing, compared with 315 in the retail sector.

**Figure 79: Foreign or jointly-owned firms tend to be larger**  
(Average number of workers by ownership)



Source: Establishment Census, 2011.

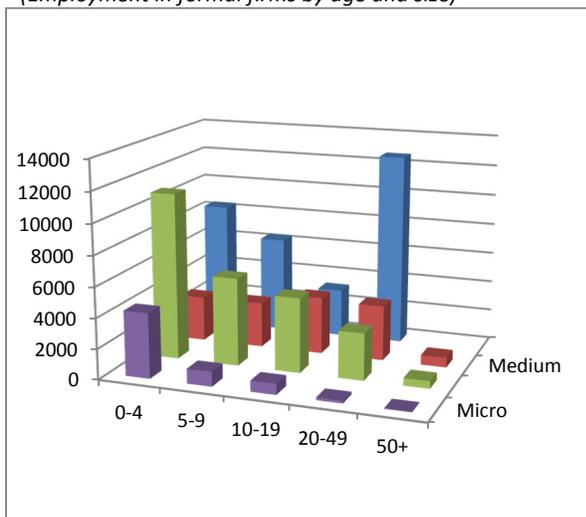
**Foreign owned firms are more likely to hire temporary staff and more likely to hire skilled workers.** Over one third of foreign owned companies hire temporary staff compared with less than one-seventh of Rwandan firms. In terms of skills, foreign firms hire more tertiary graduates as a share of their workforce. On average, 37 percent of foreign firms hire workers with a minimum of secondary education, compared with 23 percent of Rwandan firms. Adjusting for size, large

foreign firms are twice as likely to hire a worker with post-primary education as a Rwandan owned firm.

**Reflecting the overall pattern of youthfulness, formal and foreign firms are also mostly young in Rwanda.** Employment in formal and foreign firms however is less concentrated in young firms (Figure 80 and Figure 81), hinting at greater longevity of these firms compared to informal ones. Formal firms, in particular small firms, added a substantial number of jobs since 2006 (Figure 80), confirming the figures from Chapter 2 on the rapid expansion of the formal private sector (from a low base). Foreign firms too created jobs in the four years preceding the census, but in absolute numbers employment in these firms remains low (Figure 81).

**Figure 80: Employment in formal firms tends to be concentrated in young firms**

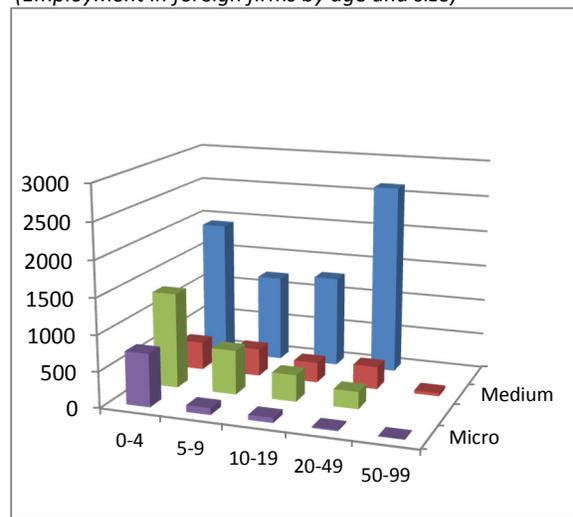
*(Employment in formal firms by age and size)*



Source: Establishment Census, 2011.

**Figure 81: Foreign firms have created jobs**

*(Employment in foreign firms by age and size)*



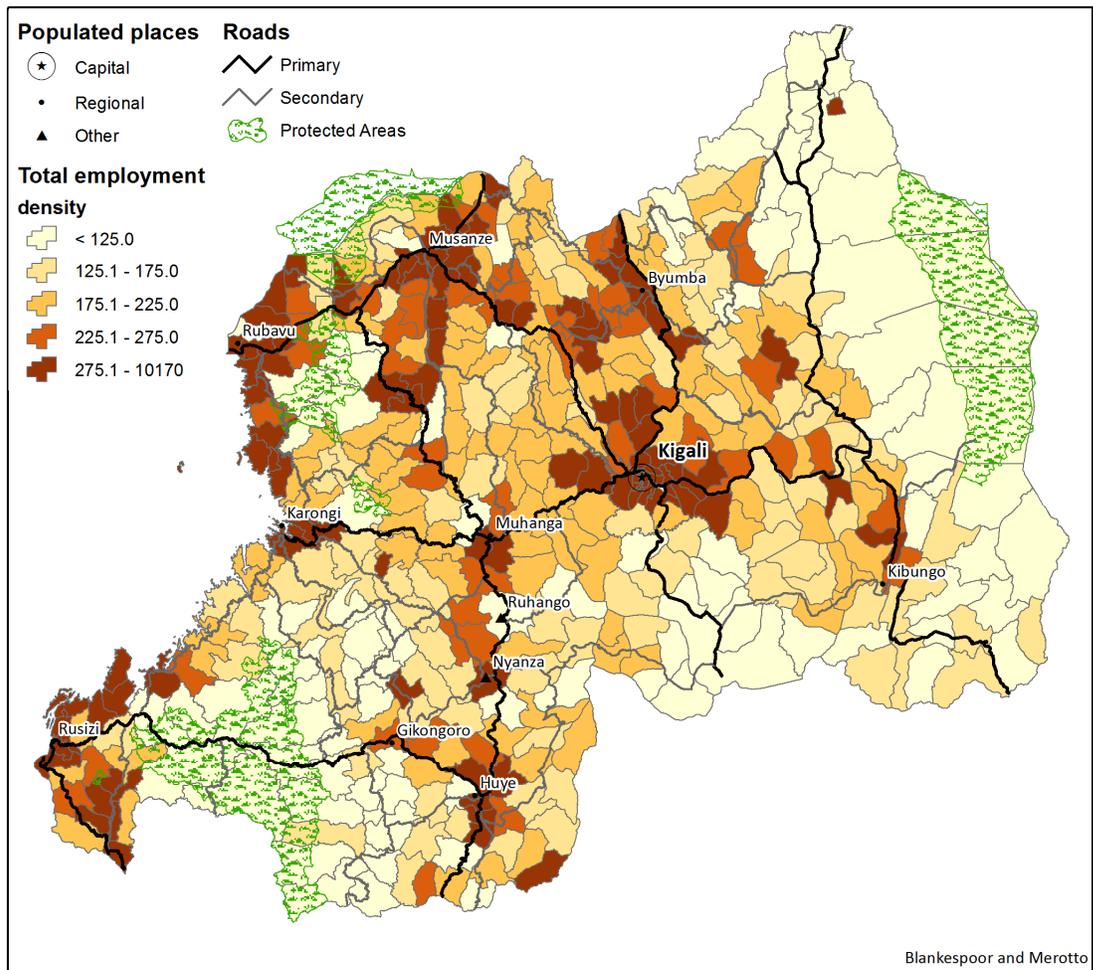
Source: Establishment Census, 2011.

### 3. Mapping Jobs in Establishments

**Nonfarm jobs in establishments are concentrated around the main urban agglomerations and in the Western province.** Employment density is highest in the sectors in Kigali, Rubavu, Musanze and Rusizi, and, to a lesser extent, Byumba, Huye and Muhanga (Figure 82). Employment is clearly concentrated along the main national roads: the further away from a national road, the lower the employment density. Employment in establishments is also relatively dense in the Western Province along the shoreline of Lake Kivu.

**Digging deeper, firms and jobs in services are concentrated in the main urban centers, whereas agriculture and commodity-based jobs in establishments that produce tradeables are located in the Western Province (Figure 83 and Figure 84).** Figure 85 brings out the regional shares of population and jobs in establishment more vividly. Kigali houses 11 percent of the population of Rwanda, but accounts for 29 percent of all jobs and 31 percent of all non-tradeable jobs. The Western Province has 24 percent of the population, 22 percent of jobs in establishments, but 36 percent of jobs in establishments producing tradeables. The Western and Northern Province together account for almost 60 percent of employment in tradables.

**Figure 82: Employment in establishments is concentrated in the main urban areas and in the Western Province**  
*(Employment density by sector )*

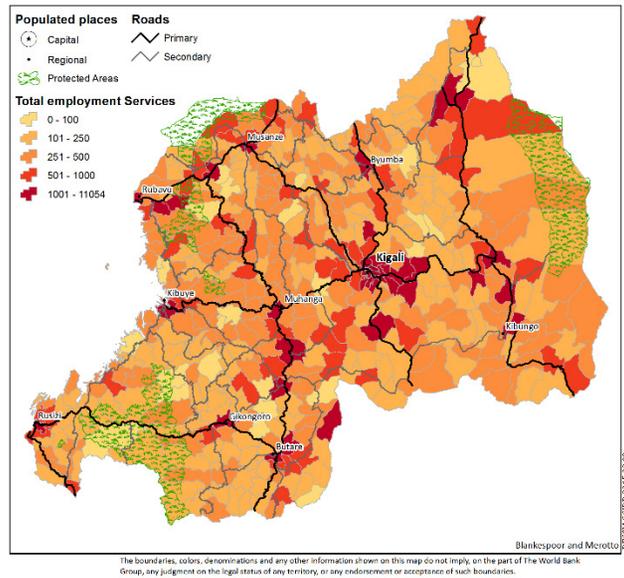


The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of The World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.

Source: Establishment Census, 2011.

**Figure 83: Service jobs are concentrated in urban areas...**

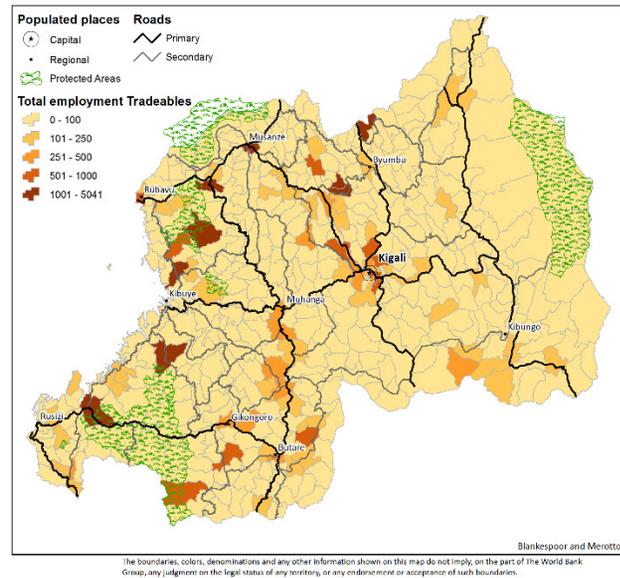
*(Total number of jobs in services establishments, by sector)*



Source: Establishment Census, 2011

**Figure 84:..while employment in tradables is concentrated in the west**

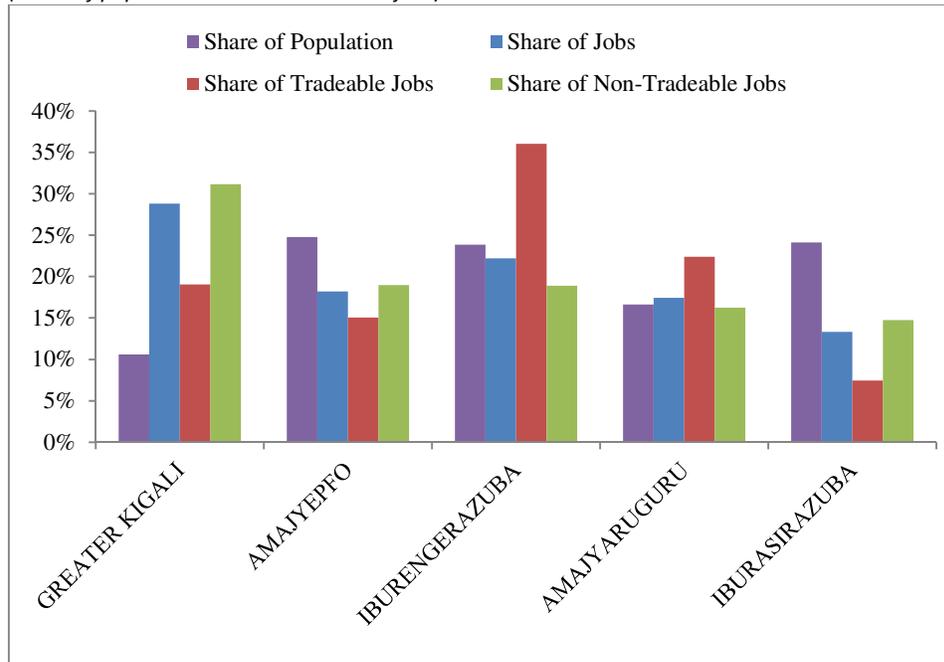
*(Total number of jobs in establishments producing tradables, by sector)*



Source: Establishment Census, 2011

**Figure 85: The Western Province has the highest share of tradable jobs**

*(Share of population and establishment jobs)*

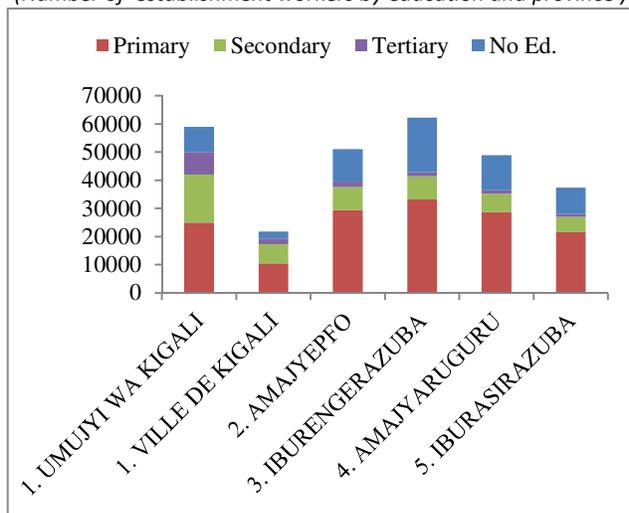


Source: Establishment Census, 2011.

**The skills content of jobs in establishments follows a similar pattern, with jobs requiring higher levels of education concentrated around the urban centers, and lower-skilled jobs out west.**

**Figure 86: The Western Province has the highest share of unskilled employment in establishments**

*(Number of establishment workers by education and province)*



Source: Establishment Census, 2011.

whereas jobs held by workers with primary education are quite evenly dispersed across provinces, half of the jobs for workers with post-primary education are in and around Kigali (50 percent). In fact, the Kigali area accounts for almost two thirds (63%) of all enterprise jobs for which workers have tertiary education. In contrast, only 18 percent of the jobs in enterprises for which workers have no education are located around Greater Kigali. The Western Province has the highest share of unskilled employment, and also the highest share of temporary employment (the Western Province accounts for 40 percent of all temporary employment in Rwanda). This

can be explained by the nature of establishments in the Western Province (tea and coffee growing estates), which does not require much skilled labor.

Figures 84, 85, and 86 suggest that the location of nonfarm establishments is related to agglomeration effects (urban centers), transport connectivity, and production centers of tea and coffee. A more formal investigation confirms this. In a 2014 study, World Bank staffs find that enterprise location in Rwanda is determined by<sup>35</sup>:

1. **Agglomeration effects:** Firms tend to locate where there is already a substantial density of firms-mainly in urban areas;
2. **Domestic connectivity:** Firms tend to settle in Districts with better access to domestic markets, defined as transportation cost to a city of a certain minimum population;
3. **External connectivity:** Transportation costs to a seaport matter, but is not robust across specifications (that is, evidence of impact of external connectivity on firm location in Rwanda is mixed);
4. **Agricultural production centers:** Agribusiness firms tend to locate in rural areas close to their production centers-explaining the overrepresentation of establishments producing tradables in the West;
5. **Electricity:** Firms' location decision is crucially dependent on local electricity accessibility;

### 3.1 A closer look at the Western Province

**The Western Province is the unlikely champion of nonfarm job creation.** With an adult literacy rate the lowest in the country (65.3 percent<sup>36</sup>) and one of the highest poverty rates (48 percent), the Western Province accounted nonetheless for the highest share of non-farm job additions between 2006 and 2011: over this period, the number of nonfarm workers in Rwanda increased by about 0.6 million, the single biggest part of which (27 percent) was accounted for by the Western Province. Rubavu and Rusizi District each added more than 30,000 nonfarm workers between 2006 and 2011, while Rutsiro, Ngororero and Nyamasheke each added well over 20,000 (Figure 87).

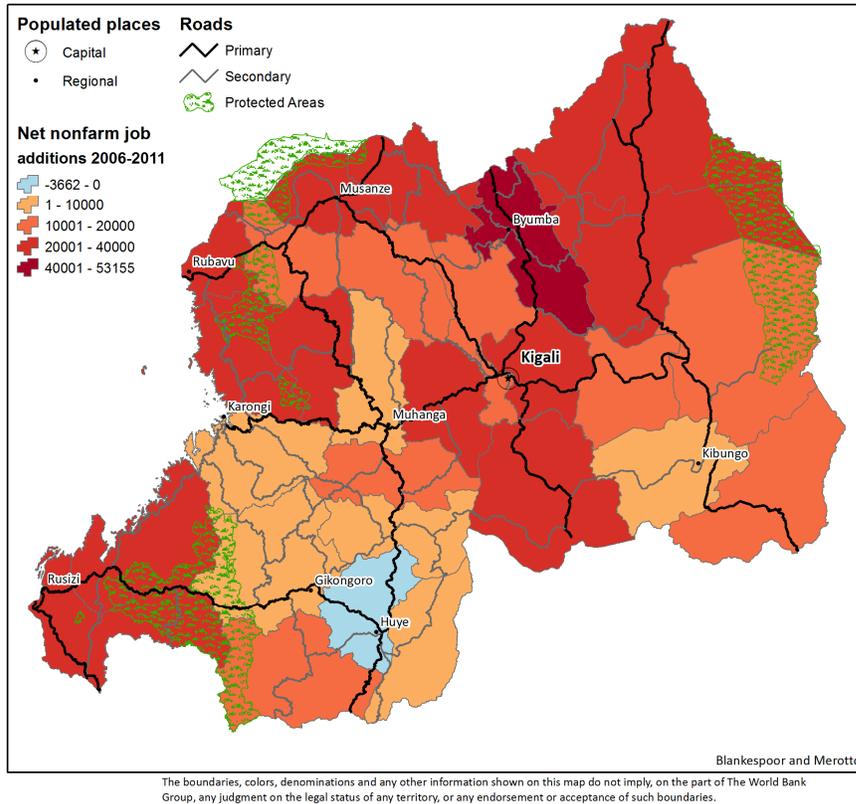
**Figure 87: The Western Province added most nonfarm jobs**

*(Number of nonfarm job additions by district, 2006-2011)*

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<sup>35</sup> Iimi, A, Humphrey, R. and Melibaeva, S. (2014) "Firms Locational Choice and Infrastructure Development in Rwanda". *Policy Research Working Paper*. Washington DC: The World Bank.

<sup>36</sup> PHC, 2012.

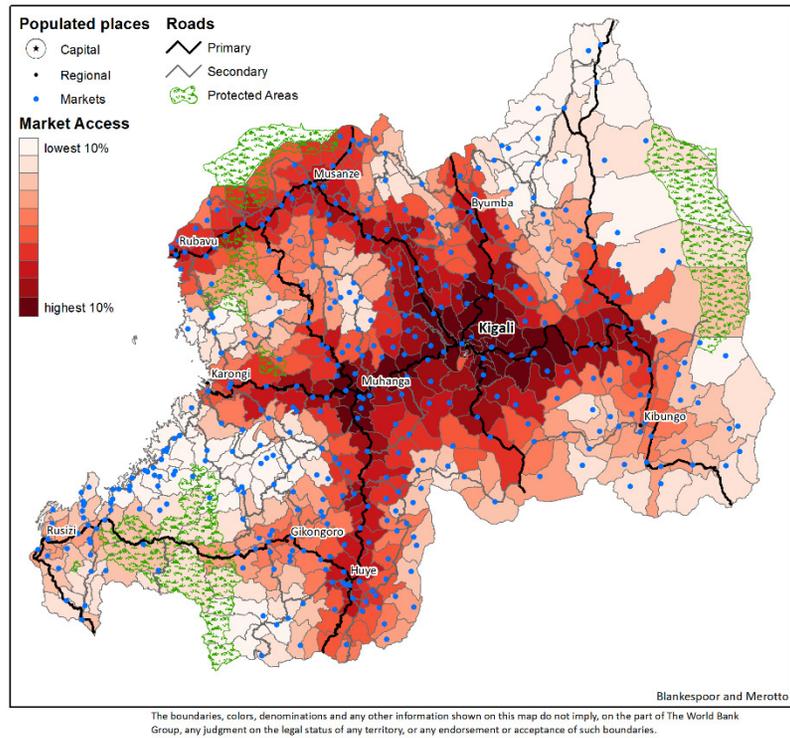


Source: EICV2 and EICV3.

**Although the west and southwest of the country are the main tradable-producing regions and added most of the nonfarm workers, they are also the most isolated.** Figure 88 suggests that market accessibility is worst in the area around Rusizi and between Rusizi and Karongi, where a fair share of the tradable firms is located<sup>37</sup>. This area is also the poorest of the country (Figure 89). In addition, external connectivity of the Western Province is poor too: the cost of transporting goods from the Western Province to the Mombasa seaport exceeds \$200 per ton and is the highest in the country (Figure 90). Though more detailed spatial analysis and better data on enterprise productivity would be required, it seems that improving connectivity—both domestic and external—in the Lake Kivu region, in particular between Rusizi and Karongi, may be necessary to stimulate productivity gains for tradeable production and increase earnings for nonfarm workers. While the data do not allow to estimate the potential for infrastructure enhancements to stimulate more and better jobs in these areas, it is certain that the areas in Rwanda where tradables are being produced suffer the largest infrastructure gaps.

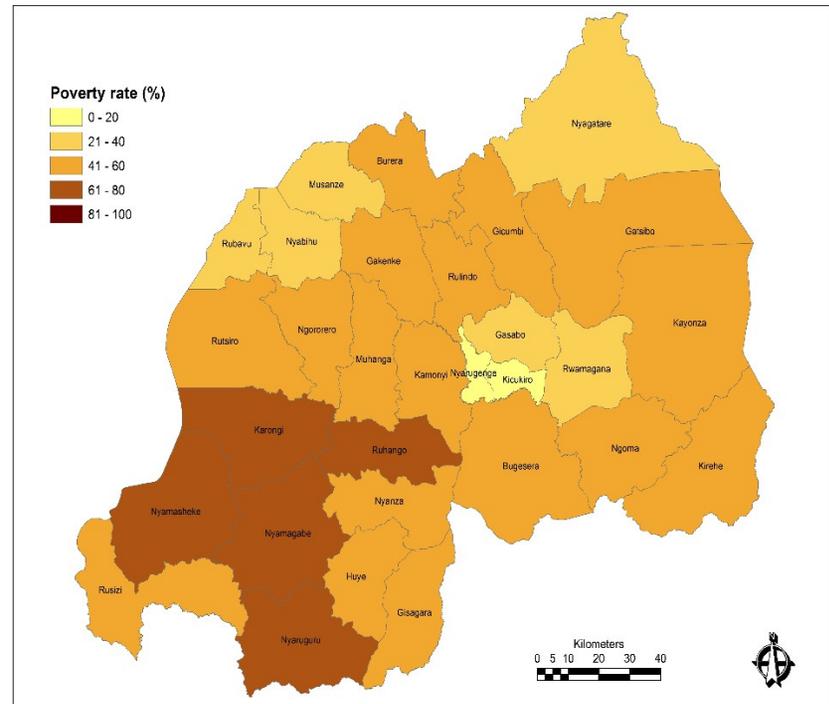
<sup>37</sup> The market accessibility index is defined as the population-weighted travel time to a town of more than 50,000 people. Keeping town size fixed, the longer the travel time to reach the town, the lower the market accessibility. Keeping travel time fixed, the smaller the town, the lower the market accessibility.

**Figure 88: Market accessibility is low in the east and the southwest**  
*(Market accessibility index, by sector)*



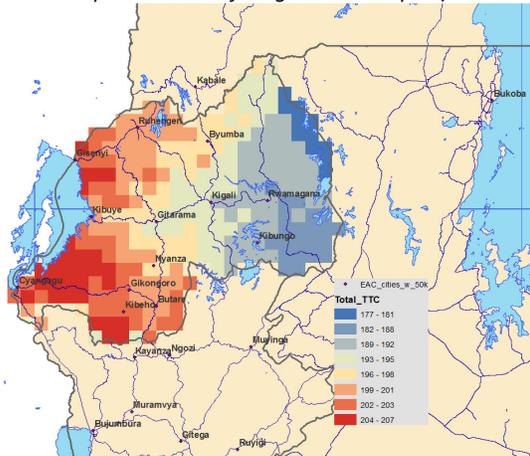
Source: Establishment Census, 2011

**Figure 89: And poverty levels are high**  
*(District-level poverty rate)*



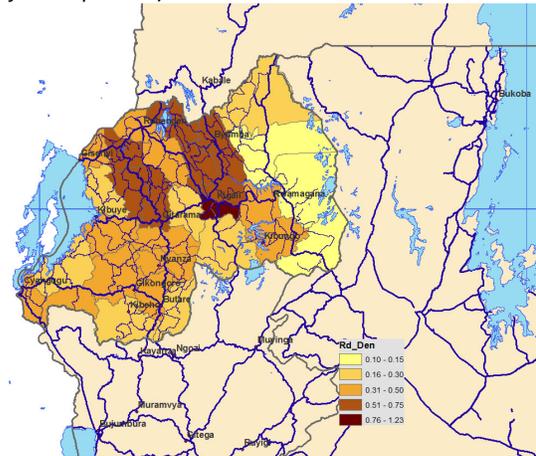
Source: EICV, 2011

**Figure 90: External connectivity in the west is poor**  
 (\$ cost to transport one ton of cargo to the seaport)



Source: Iimi, Humphrey and Melibaeva, 2014

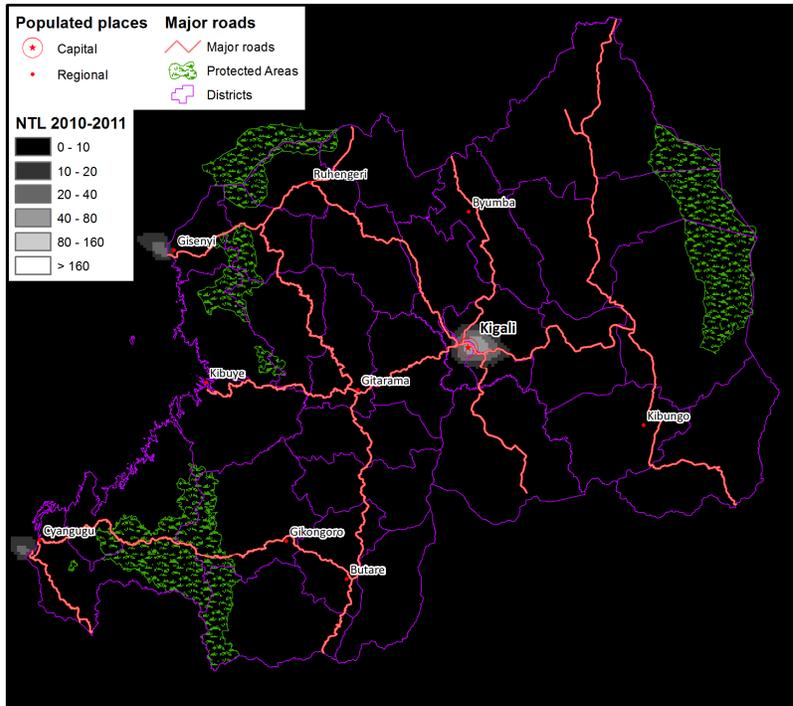
**Figure 91: Road density is lowest in the southwest and in the east**  
 (Km of roads per km<sup>2</sup>)



Source: Iimi, Humphrey and Melibaeva, 2014

**The Western Province, and in particular the towns of Rubavu and Rusizi, are well placed to exploit the big markets in Eastern DRC.** Figure 92 depicts the intensity of night lights as measured from space, which is increasingly being used as an indicator of economic activity. The map shows that in Rwanda, economic activity is strong only in Kigali. On the DRC side of the border though, the night time lights imagery points to strong economic density in the cities of Goma and Bukavu across the border in DRC along the shores of Lake Kivu. While connectivity to Goma appears good (at least until the border), coming from Kigali, Musanze and Muhanga, connectivity to Bukavu seems a lot worse (Figure 91 shows low road density in the southwest, where the border crossing to Bukavu is located). More work would be needed to understand the potential for infrastructure improvements to boost trade with these two urban centers in DRC, but in principle, the potential seems strong for trade to drive growth, job creation and urbanization in Western Rwanda.

**Figure 92: Economic density is high in Kigali, Goma and Bukavu**  
 (Intensity of night lights as seen from space)

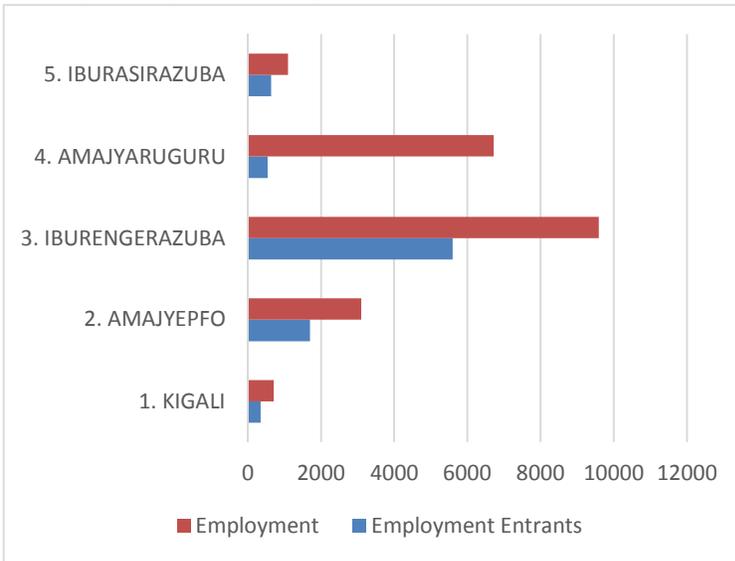


The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of The World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.

**Related to its location as a gateway into DRC, a significant number jobs in traditional and non-traditional exports are in the Western Province.** Traditionals are products which Rwanda traditionally exports, and has a significant volume of exports. For Rwanda these are tea and coffee and their processing, and mining (of tin and non-ferrous ores). “Non-traditional” exports are products in which Rwanda has a revealed comparative advantage in 2010 and has recently started to export values exceeding US\$1 million, but which a decade earlier were not significant exports. These include cut flowers, horticulture, processed fruits and vegetables, grain mill products, tanned leather, quarrying products, and the manufacture of knitted and crocheted products. The Western Province has most employment in firms producing exports, and has also added most employment in exports over the past three years (the years preceding the 2011 census-Figure 94).

**Figure 93: The Western Province has most employment in exports and has also attracted new firms that export**

(Employment in firms producing exports, by Province)



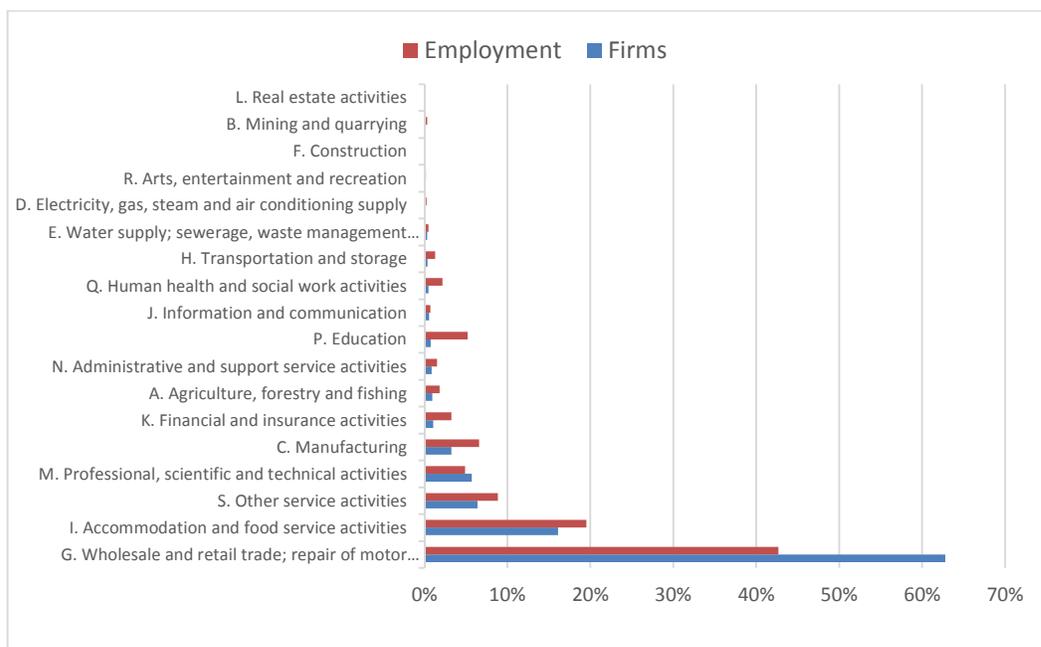
Source: Establishment Census, 2011.

### 3.2 A closer look at the six secondary cities

**Rwanda's medium term development plan, the EDPRS-2, plans for the proactive urbanization of six secondary cities to act as local poles of growth and off-farm job creation.** For now the six secondary cities (Rubavu, Rusizi, Huye, Muhanga, Musanze and Nyagatare) are mostly service centers. Over three quarters of employment in the secondary towns is in trade: wholesale & retail and in restaurants, bars and hotels. Figure 94 shows the dominance of services in both establishments and employment in the 22 geographical sectors which make up the six secondary cities. Significant employment in the Western Region around Rubavu comes from tea & coffee and mining cooperatives, as well as hotels and restaurants. The sector of Nyundo in Rubavu seems to do especially well in employment in coffee and tea distributors. Huye's economy runs around Ngoma, where several cooperatives function in grain growing and milling (including rice), and manufacturing and processing of foods and metal products. Muhanga is comprised of a lot of small producers, mostly in retail in the sector of Nyamabuye. Musanze has an economy built around hotels for gorilla tours, cement and building materials and agro-chemicals production. Finally, like Muhanga, Nyagatare has a small economy with mostly micro firms. Of the proposed secondary cities, Rubavu and Musanze arguably have the highest potential for more job creation and higher labor productivity, given their more diversified products and the presence of tradables production.

**Figure 94: Services dominate firms and employment in the six secondary cities**

*(Share of establishments and employment in establishments, six secondary cities)*



Source: Establishment Census, 2011.

**The Government of Rwanda may wish to consider how to stimulate investment by tradeable firms in developing the six secondary cities chosen as growth poles.** The six cities together account for 13 percent of both established firms and employment in established firms (Table 16). Yet only 5 percent of these firms (just 809 establishments), and 11 percent of the employment, is in tradeables production. Large and medium scale establishments in these cities are rarer still – there were just 34 of them in the 2011 Census, with 4 of these in manufacturing and 8 in tradeables production. Of the six secondary cities, Muhoza sector in Musanze stands out for tradeable production, with its cement factory, building materials and agro-chemical plants. Rusizi and Rubavu should both have the potential for trade with the much bigger cities of Goma and Bukavu in DRC, but development of these areas will require better transport accessibility, and improved border crossing into and out of DRC. Recent experience in Zambia suggests that there is scope for building materials producers and distributors, and supermarket outlets to open up in Rubavu and Rusizi to supply cities in Eastern DRC.

**Table 16: The six secondary towns are marginal in terms of employment in establishments**

*(Firms and employment in firms in Rwanda, Kigali, and six secondary towns)*

	Rwanda	Kigali	Six Towns
Firms	127,662	29,793	16,738
Employment	280,005	80,629	35,232
Tradeable Jobs	54,253	10,331	3,536
Non-Tradeable Jobs	225,752	70,298	31,696

Firms	100%	23%	13%
Employment	100%	29%	13%
Tradeable Jobs	100%	19%	7%
Non-Tradeable Jobs	100%	31%	14%

Source: Establishment Census, 2011.

#### 4. Conclusions

**Establishments in Rwanda provide employment to only a tiny share of working-age population.** The roughly 128,000 enterprises enumerated during the 2011 Establishment Census account for less than six percent of overall employment, underscoring the nature of establishments: Micro, often employing only one person – the owner, informal, and operating in the service sector. 93 percent of firms are micro, 95 percent are informal, and 95 percent are active in the service sector. The formal sector, though growing rapidly since 2006, is small and will remain so for the near future, and specializes in tea and coffee growing and processing and food product manufacturing.

**Employment in establishments is concentrated in the main urban centers, along the main roads, and in the Western Province.** Services are located in urban areas and along roads, while employment in tradables and exports is mainly located in the Western Province. The Western Province accounted for the biggest increase in nonfarm workers between 2006 and 2011, but is isolated and underserved in terms of infrastructure: Market accessibility is lowest in the Western Province, in particular around Rusizi and between Rusizi and Karongi. Unlocking this part of the country may be important to improve access to markets and boost productivity in tradables. In addition, the strategic position of the Western Province’s main cities-Rusizi and Rubavu-as gateways to the bigger cities in Eastern DRC suggests that the Western Province holds substantial job-creating potential over the short-to medium term.

## Chapter 4: Employment outlook and perspectives

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### 1. Introduction

**Past employment trends in Rwanda have been firmly positive.** The share of the labor force employed in agriculture has fallen fast, earnings have increased substantially and employment in the formal private sector has doubled (between 2006 and 2011). Wage employment is increasing while non-wage employment is becoming less frequent, signaling the start of a move from non-wage self-employment to a proper “labor market” where people sell their time and skills in return for a wage-although this move is only in its infancy. Youths have been the engine of change, spearheading the move to nonfarm activities and wage employment and increasingly abandoning agriculture altogether. In this concluding chapter, we sketch the medium-term outlook for growth and employment in Rwanda and discuss the implications, both in terms of policy and future research, of the findings of the analysis.

### 2. Medium Term Outlook

#### *Favorable population dynamics*

**Over the coming decades, Rwanda will have a unique opportunity for accelerated growth through the so-called demographic dividend<sup>38</sup>.** Driven by a sharp decrease in fertility since 2005 (the total fertility rate dropped from 6.1 in 2005 to 4.6 in 2010 and 4.0 in 2010<sup>39</sup>), the proportion of working-age adults in total population is expected to increase from 57 percent in 2014 to 60 percent in 2020 and 65 percent in 2032 (the final year of the 2012 census population projections)<sup>40</sup>. Concurrently, the youth dependency ratio, a measure of the dependency burden in the economy, is projected to decrease from 74 (children per 100 working-age adults) in 2014 to 67 in 2020 and 55 in 2032. A higher proportion of workers in the population and a lower dependency rate offer the opportunity to substantially raise economic output<sup>41</sup>.

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<sup>38</sup> See World Bank (2013). “*Rwanda Economic Update 5: Seizing Opportunities for Growth, with a Special Focus on the Demographic Dividend*”.

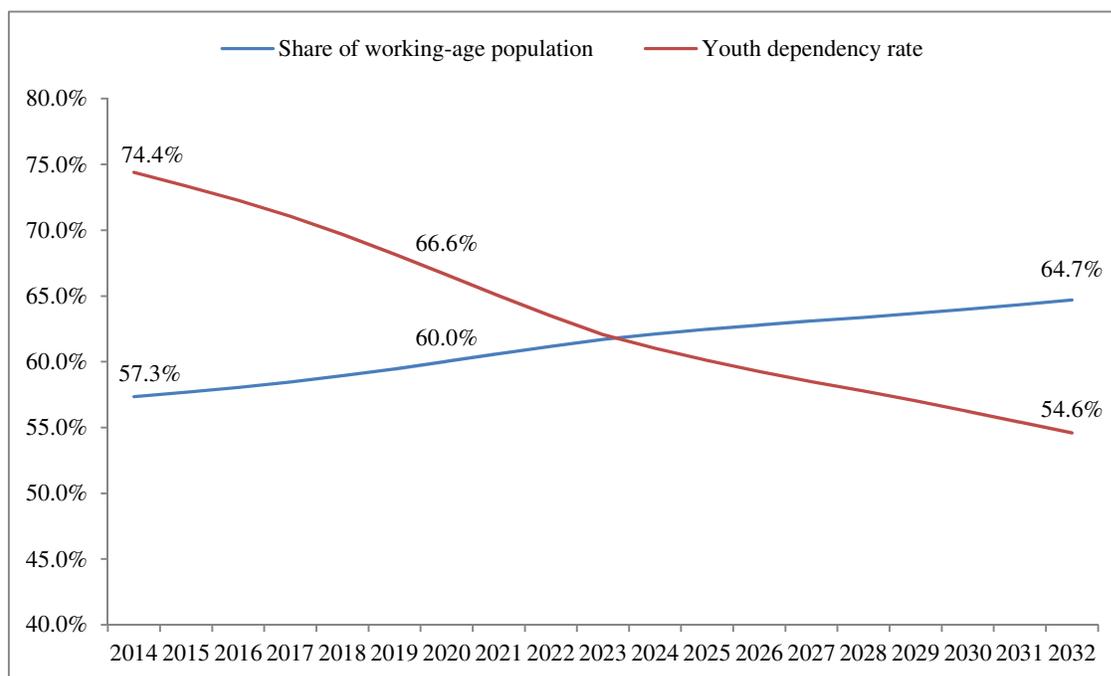
<sup>39</sup> The 2005 and 2010 fertility rates come from the 2005 and 2010 Rwanda Demographic and Health Surveys (RDHS). The 2012 fertility rate is estimated based on the 2012 Population and Housing Census and may not be fully comparable with the DHS estimates.

<sup>40</sup> Based on medium fertility scenario.

<sup>41</sup> See World Bank (2014) for an estimate of the potential economic impact of the population dynamics in Rwanda.

**Figure 95: The blessings of lower fertility**

(Share of working-age adults in total population and youth dependency rate, 2014-2023)



Source: NISR, 2014; World Bank staff calculations

**Next to the age-structure of the population, the geographic structure is projected to change too.** In 2012, only 16.5 percent of the Rwandan population lived in urban areas<sup>42</sup>. This is projected to increase to 22 percent by 2020 and 30 percent by 2032. This urbanization process could be an important catalyst for creating the conditions for reaping the demographic dividend. Urbanization, if well-managed, has many advantages, several of which are conducive for realizing the dividend. For similar levels of education and wealth, urban women tend to have fewer children than rural women, which means urbanization would speed up the fertility drop and lead to a sharper demographic transition. A sharper transition would lead to larger potential income gains. Urban children are also likely to achieve higher levels of schooling, equipping them with the skills they need to participate in the formal workforce. Urbanization is also associated with higher economic growth rates and the creation of nonfarm jobs, which Rwanda will sorely need in light of increasing pressure on arable land. In addition, urbanization to secondary towns, a key element the EDPRS 2 transformation agenda, is linked to accelerated poverty reduction.<sup>43</sup>

### *Solid growth through 2020, driven by productivity improvements and demographics*

**Rwanda's GDP is estimated to grow steadily through 2020.**<sup>44</sup> The potential growth rate of the economy—the growth rate that could be obtained if all production factors are used efficiently—is

<sup>42</sup> Intriguingly, this is slightly down from 16.9 percent in the 2002 census.

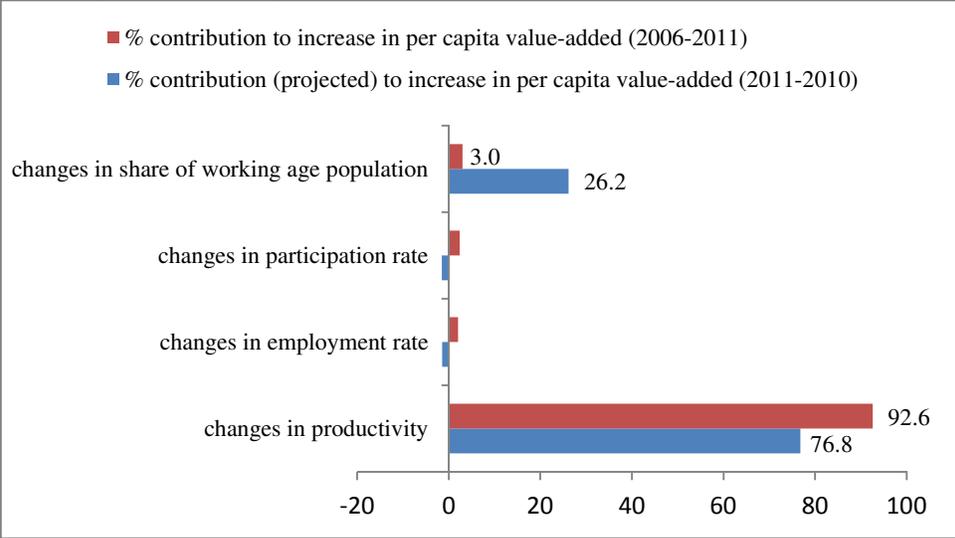
<sup>43</sup> Christiaensen, L., De Weerd, J. and Y. Todo 2013. "Urbanization and Poverty Reduction: The Role of Rural Diversification and Secondary Towns." *Agricultural Economics* 44 (4–5): 435–47.

<sup>44</sup> Interested readers may refer to Box 1.11 in the fifth edition of Rwanda Economic Update, World Bank (.

estimated at 7.8 percent for the 2012-20 period, similar to the growth rate observed between 2000 and 2011 (about 8 percent per annum). Physical capital will make the largest contribution to GDP growth (3.2 percentage points), followed by total factor productivity (2.7 percentage points) and human capital-adjusted labor (1.9 percentage points)<sup>45</sup>.

**Over the coming five years, increases in labor productivity and in the share of working age population are expected to be the main drivers of growth in output per capita.** During the 2006-11 period, more than 90 percent of the increase in output (value added) per capita was attributed to higher productivity, while the share of the labor force, participation rate, and the employment rate were relatively stable. Going forward, labor productivity is expected to continue to drive output per capita, but the demographic shifts (the increased share of the working age adults in total population - see previous section) will increasingly gain importance as a driver of aggregate growth<sup>46</sup>. Overall, productivity improvements are expected to account for 77 percent of the increase in per capita value-added between 2011 and 2020, down from 93 percent during 2006-2011, while the demographic changes –reaping the demographic dividend- will account for 26 percent (Figure 96). The projected decrease in the participation rate- a result of increased enrollment in secondary and tertiary education- is expected to have a small negative effect on growth in per capita value-added.

**Figure 96: Productivity and demography will drive economic growth**  
*(Percentage contribution to growth in per capita value-added, 2006-2011 and 2011-2020)*



<sup>45</sup> World Bank (2013). *“Seizing Opportunities for Growth, with a special focus on Harnessing the Demographic Dividend.”* World Bank: Rwanda Economic Update 5.

<sup>46</sup> This is based on a forward-looking Shapley decomposition using projections of employment growth, population growth and overall economic growth. For details, see Annex 6.

Source: World Bank staff estimates and calculations

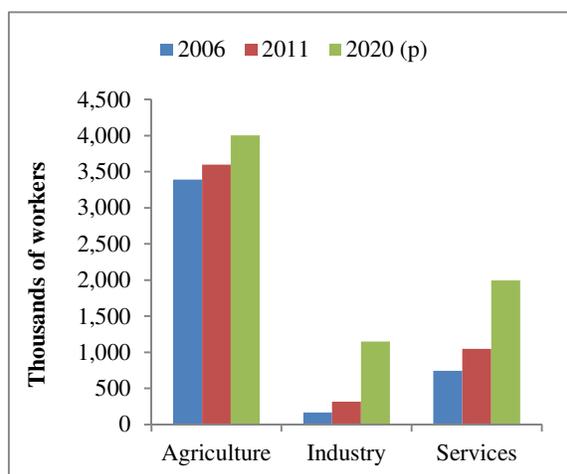
### *A sustained farm to non-farm transition driving overall productivity growth*

**If Rwanda maintains its growth momentum until 2020, the shift from agriculture to non-farming will accelerate**<sup>47</sup>. Under a baseline scenario of 7.8 percent GDP growth between 2011 and 2020 and the same productivity increases as during 2006-11, the share of agriculture in employment will drop to almost half (56 percent) of total employment by 2020<sup>48</sup>, down from about 70 percent in 2011 (Figure 98)<sup>49</sup>. Agriculture will continue to add workers, but job creation will be much faster in industry –particularly construction- and services (Figure 97). If the economy grows even faster, closer to the desired 10.5 percent per annum, the shift towards non-farm employment would be even greater.

**In the baseline scenario, employment by 2020 will grow by 2.2 million people, 1.8 million of whom will be employed outside agriculture.** This means that in the baseline scenario Rwanda’s target of creating 200,000 off-farm jobs per year (as articulated in the National Employment Programme) would be reached<sup>50</sup>. Mining and construction are projected to create employment at a fast pace between 2011 and 2020. Employment in mining is projected to increase almost six-fold, while construction employment will increase by a factor of four (Figure 99). Wholesale and retail will expand substantially too. Manufacturing employment will somewhat increase but will remain low.

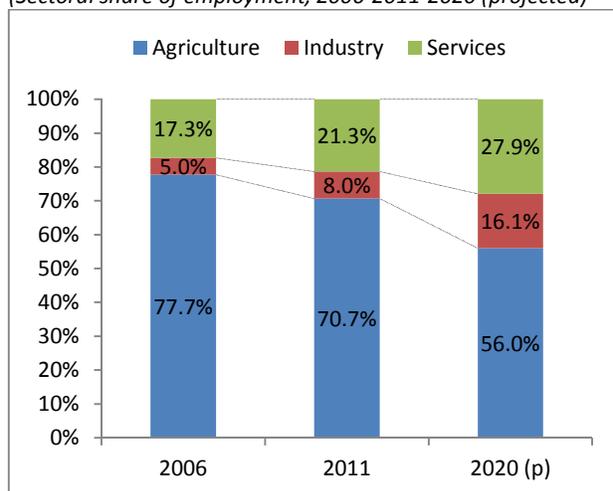
**Figure 97: Industry and services will add most workers between 2011 and 2020...**

(Number of workers by sector, 2006-2011-2020 (projected))



**Figure 98: And agriculture’s share of employment will continue to drop**

(Sectoral share of employment, 2006-2011-2020 (projected))



<sup>47</sup> The model projects what will happen to employment given projections on overall growth, sectoral growth, and population growth and composition. See Annex 6 for the assumptions used in the projections.

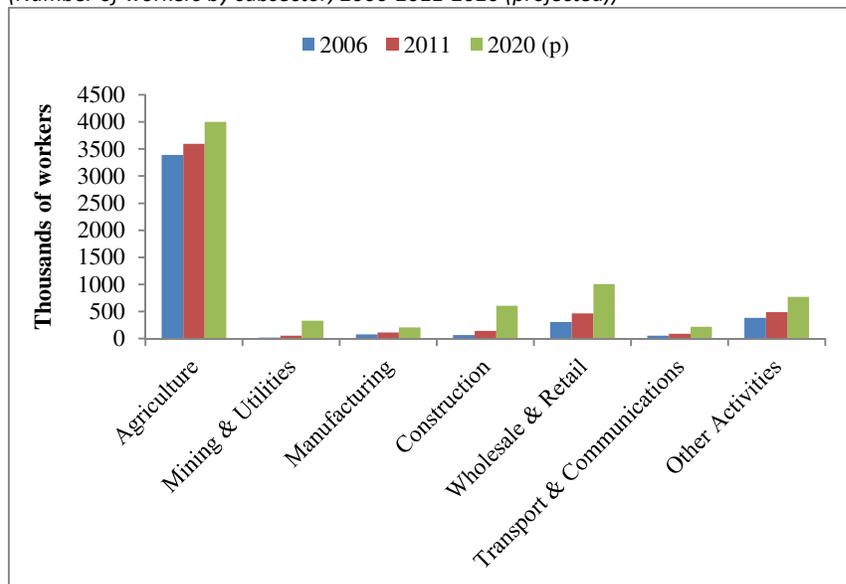
<sup>48</sup> This is comparable to the estimate of agriculture’s employment share by 2020 in Thomas, A. (2014). “SSA Employment Developments. The Important Role of Household Enterprises with an Application to Rwanda.” Washington DC: The International Monetary Fund.

<sup>49</sup> In the baseline scenario, the employment share of industry and services is projected at 16 percent and 28 percent by 2020, respectively.

<sup>50</sup> Of course, the baseline scenario is a favorable scenario. It consists largely of repeating the performance observed between 2006 and 2011, which was strong.

**Figure 99: Mining and construction will add workers at a fast pace**

*(Number of workers by subsector, 2006-2011-2020 (projected))*



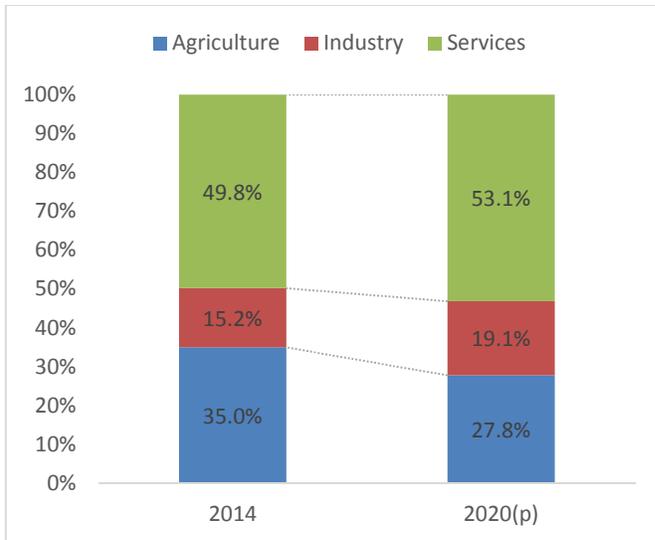
Source: World Bank staff estimates and calculations

**In the baseline scenario, Rwanda’s structural transformation is projected to continue, albeit at a modest pace.** Agriculture’s share in output is projected to decline to 28 percent by 2020, down from 35 percent in 2014 and 2011<sup>51</sup>. Services are projected to rise to 54 percent of GDP, up from 50 percent in 2014 (Figure 100). The share of industry is projected to grow from 15 percent in 2014 to 19 percent in 2020. Construction is expected to achieve the fastest growth, its share in GDP reaching 8.6 percent by 2020.

**Figure 100: Services and industry will increase their share of GDP**

*(Sectoral share of GDP, 2014-2020 (projected))*

<sup>51</sup> Figures may differ from the official ones due to the particular treatment of taxes and subsidies.

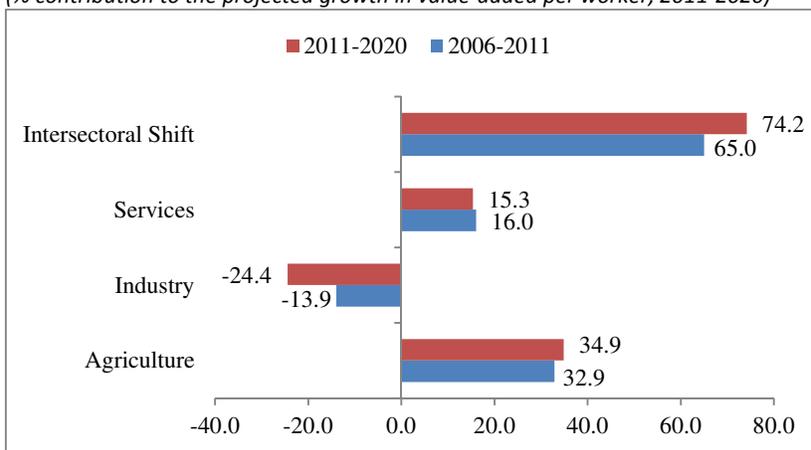


Source: World Bank staff estimates and calculations

**Overall, the progressive shift to non-farm employment will be the biggest contributor to per capita GDP growth.** The bulk of the projected increase in GDP per capita between 2011 and 2020 will be accounted for by the move of workers from agriculture to non-farming (Figure 101). Productivity improvements in agriculture are expected to have the second most important contribution, followed by services' productivity, while industry will continue to make a negative impact. These findings support the Government's plans for accelerated urbanization of the country as this would magnify both the impact of services (increased labor and productivity) and agriculture (decreasing labor but increasing productivity). The findings also highlight the importance of getting the fundamentals right for the industry sector: Improved electricity supply at lower costs and improved regional integration and transport infrastructure to facilitate trade. Otherwise, industry is likely to continue to be a drag on productivity growth.

**Figure 101: The sustained move towards non-farm activities will boost productivity**

(% contribution to the projected growth in value-added per worker, 2011-2020)



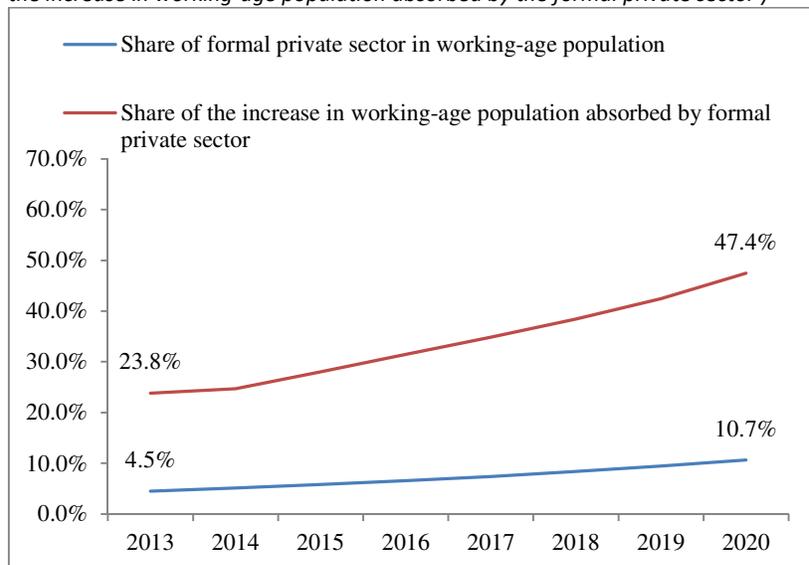
Source: World Bank staff estimates and calculations

### 3. Extrapolating the analysis: how will near-term job creation look like and what are the main questions for policy?

**Given the results of this study, what can Rwanda do to improve the employment outcomes of its population?** As indicated by the Government's National Employment Programme, almost all of the jobs to be created in the near future will need to come from the private sector, particularly MSME's and the informal sector. Indeed, the informal nonfarm sector absorbed most of the new workers since 2006. Of the about 0.6 million new workers between 2006 and 2011, 70 percent were absorbed by the informal nonfarm sector-48 percent in wage employment and 22 percent in self-employment. The informal nonfarm sector is particularly important for the youth: average age in the informal nonfarm sector (31 years) is significantly lower than in farming (38 years) and the rest of the nonfarm sector (34 years).

**While the formal private sector is growing fast, the low base means that the share of working-age population employed in this sector is projected to stay low in the foreseeable future.** Assuming that employment in the formal private sector keeps on growing rapidly (at 16.5 percent per year-the growth observed between 2006 and 2011), it would still only account for 11 percent of the working-age population by 2020 (Figure 102). This means that at least until 2020, the bulk of the increase in the labor force will need to be accommodated by either the informal nonfarm sector or agriculture.

**Figure 102: The formal private sector will remain small in terms of employment**  
(Projected share of the formal private sector in working-age population and share of the increase in working-age population absorbed by the formal private sector )



Source: EICV3, 2011; World Bank staff calculations

**Given that the bulk of young labor market entrants are likely to enter the informal non-farm sector, a key question for policy is how the environment for MSMEs in this sector can be improved.** Though the data available for this study do not say much about the constraints and opportunities in this sector, both our analysis and other existing research shows that nonfarm firms tend to settle in places with agglomeration effects (urban areas), with decent domestic connectivity

and electricity access. In this regard, the Government's strategy to develop six secondary cities is likely to boost the creation of small firms and jobs in those firms. A key question is how the urbanization of the secondary cities can be planned and managed so as to maximize its impact on employment growth, both within the cities and in the bordering rural communities. Currently, the six secondary cities are fairly similar in terms of economic activities, specializing in small services and trade firms, but local economic development studies are currently underway to examine whether the cities have revealed comparative advantages that could boost employment and firm creation.

**Substantial nonfarm activity in Rwanda is still related to agriculture.** The growing and processing of beverage crops (coffee and tea) is the main job-creating activity in the formal sector. Agribusiness and agro-industry is a key sector in the NEP, and holds the potential—still according to the NEP—to create thousands of off farm jobs for relatively low-skilled workers. The analysis in Chapter 3 however showed that the region where most of these tradables and exports are produced is also the most isolated region, suffering from poor domestic and external connectivity. Although more research and more detailed spatial data would be needed to examine the links in more detail, it is possible that enhancing transport connectivity—both domestic and external with DRC— and market accessibility in this region could help this sector to lower production and transportation costs and expand employment.

**Rwanda's small domestic market means that Rwanda should look outside its borders for growth opportunities.** Most of the secondary cities are located on or close to land borders with other countries, potentially facilitating cross-border trade. The towns of Rubavu and Rusizi in particular are ideally located as gateways into the much bigger cities of Goma and Bukavu in neighboring DRC. A key question for policy is how cross-border trade, especially between the Western Province and DRC but also with other countries, can be facilitated and stimulated to boost employment growth.

**Though the share of workers with a main job in agriculture is decreasing, our projections suggest that at least until 2020 more than half of Rwanda's workforce will be employed in agriculture.** This means that the most direct way to increase earnings for the bulk of the workers, and often the most vulnerable ones, is to further increase productivity and earnings in agriculture. While agricultural productivity has increased steadily since 2007, yield of most crops are still far below potential. Yields of cassava, one of the main staples, are estimated at only six percent of optimum potential. Other crops hardly do better: Yields of cooking bananas are estimated at 18-24 percent of potential, Irish potatoes at 24-27 percent, maize at 34-37 percent, and beans at 40 percent<sup>52</sup>, highlighting the ample room to increase productivity in agriculture. Consolidating and increasing the gains in agricultural productivity will also be important in sustaining the recent employment transitions.

**In sum, Rwanda appears to need a two-pronged employment strategy in the medium term.** On the one hand, the unskilled nature of the bulk of the labor force requires further increases in agricultural productivity and job creation in industries related to agriculture (agribusiness, agro-industry) to further improve employment outcomes for the most vulnerable group of workers. On the other hand, the rapid expansion in education means that the new labor force entrants will be increasingly educated, which will require the creation of more skilled and semi-skilled jobs. Expansion of economic activity in the secondary cities will be important in this regard, as will be

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<sup>52</sup> NISR, 2014b.

the ongoing efforts to expand access to electricity and improve the domestic and external connectivity of the economy.

#### **4. Further research and knowledge gaps**

**The analysis conducted for this study has produced a number of findings warranting further research and identified several knowledge gaps.** First is the disadvantaged employment position of women. Women are overrepresented in the least desirable job categories and earn substantially less than men even accounting for observable differences (such as education, age and location). This pattern persists among young cohorts, despite young women being no less educated than young men. Possibly, women face particular barriers in accessing better wage jobs in the non-farm sector, which explain their underrepresentation in non-farm wage employment.

**Second is the pattern of urbanization.** Although the Urbanization and Rural Settlements sector strategy states that urban population in Rwanda is growing fast, this is not supported by the data— even to the contrary. Urban population share in the 2002 census was 16.9 percent, marginally higher than the population share in the 2012 census (16.5 percent). Similarly, the share of the working-age population living in urban areas decreased from 17.7 percent in 2006 (EICV2) to 16 percent in 2011 (EICV3). In addition, little is known about the size and growth of the secondary cities<sup>53</sup>. To study the link between urbanization, the growth of non-farm employment, and poverty reduction, more detailed and consistent data about urban settlements would be needed.

**Third is the potential for external links and cross-border trade to stimulate employment.** While Rwanda is constrained by its small domestic market and its distance from major ports, it is well-positioned as a gateway into the larger DRC market. More research would be needed to gauge the extent to which targeted infrastructure investments close to borders (not only with DRC, but also with other neighbors) can facilitate or add value to cross-border trade and spur local economic development in the border communities.

**A final issue is related to data.** Currently, most of the sources of data on employment and living standards (the EICV surveys, the population and housing census, the establishment census) do not allow identifying the secondary cities. While combining the “urban” and “district” identifiers in the data can allow an analyst to guess whether the data actually refers to a secondary city, more detailed city identifiers would need to be included in the data to facilitate any examination of the link between growth of cities, employment growth, and improved living standards. In addition, despite its importance for job creation, there is a dearth of data on the informal non-farm sector. More and better data on this sector would be needed to examine its potential for accelerated job creation and to identify the principal constraints to productivity improvements in this sector.

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<sup>53</sup> To illustrate, many of the geographical sectors that Rwanda Housing Authority (RHA) considers as being part of the secondary cities have in fact zero urban population according to the 2012 Population and Housing Census.

## Annexes

### Annex 1: Definitions

Employment	
Labor force	The sum of the working age employed and unemployed.
Employed	An individual who performed market activities for at least one hour in the week prior to the survey, or who has a permanent job. For the calculations of earnings however, given the big seasonality effects, the reference period is extended to the 12 months preceding the survey to also capture earnings of individuals who worked in the preceding 12 months but not in the preceding 7 days.
Unemployed	A working-age individual who is not employed but is actively looking for work
Inactive	A person who is neither employed nor actively looking for work.
Working-age population	In the Rwandan context, defined as all people 16 years of age and above
Wage worker	A worker who has declared being paid a wage or salary for his or her work.
Employer	A person who is said to be in charge of a household non-farm enterprise that hires paid labor from outside the household.
Self-employed	A person working in a household non-farm enterprise or a household farm in which no other household member or paid non-household member is also working.
Household enterprise worker	A person who is working in a household non-farm enterprise or a household farm in which other household member are also working but is not an employer.
Independent farmers	A person working on his/her farm and describes him/herself as the boss of the family farm. Usually the household head.
Unpaid family farmer	A household member working on the family farm without pay and without being the independent farmer. Usually these are family members (spouse and children) of the independent farmer who also work on the farm.
Formal employment	Wage employment where the individual declares his/herself to be working in one of the following sectors: public, parapublic, private formal or NGO.

Main job	The job the individual spends most of his working time doing. Main job is defined in terms of time (the job that occupies most of the time of the worker) and not in terms of earnings (the job that procures the most earnings).
<b>Earnings</b>	
Earnings	All cash payments, payments in kind, and benefits received in exchange for labor services in wage and salaried employment, self-employment, and other forms of labor exchange. Depending on the context, earnings include only primary job earnings or the sum of earnings in all reported jobs. In this study earnings are often presented using total annual earnings from all jobs based on the sector of the primary job.
Wage earnings	Total cash and in-kind earnings as declared in the survey.
Earnings of the self-employed, employers, household enterprise workers, and unpaid family farmers	Earnings are calculated in the following manner: First, net revenues are constructed at the enterprise level. (Note: the family farm, and all of its varied crop/livestock activities, is considered one enterprise while there may be multiple non-agricultural enterprises per household.) Next, these net revenues are distributed across all household members engaged in that enterprise. Since individuals report the hours s/he worked on each enterprise, each individual received a share of net revenues from the enterprise equal to his/her share of total hours worked in that enterprise. Revenues are allocated to contributing individuals regardless of their self-reported employment classification. That is, persons reporting to be unpaid family farmers also get allocated revenues proportionally to their hours worked on the farm.
Low earner	An employed individual whose annual earnings are below the national poverty line of 64,000 2001 RWF.

## **Annex 2: Comparability of the data sources**

The analysis in Chapter 2 is largely based on the comparison of the EICV2 (2006) and EICV3 (2011) surveys. As such, it is important to assess the comparability of the surveys to make sure the observed trends are real rather than due to differences in survey and questionnaire design.

On sampling, the EICV2 and EICV3 used the same sampling frame (provided by the 2002 census) and the same methodology to select the primary sampling units (PSU) and the households. The key difference between EICV2 and EICV3 relates to the size of the sample and the urban-rural classification. The EICV2 survey was designed to be representative at the level of the 12 old provinces (sample size of 6,900), while the EICV3 was representative at the level of the 30 new Districts (sample size of 14,308). The EICV3 also updated the rural-urban status of enumeration areas to account for the changes since the 2002 census. Since the analysis in this report does not stratify by urban-rural location, this does not affect the results.

The questionnaires used for EICV2 and EICV3 were largely similar. The main difference in the employment modules is the way in which the time worked during the 12 months preceding the survey is captured. In EICV2, the respondents were asked on a month-by-month basis whether or not they worked that particular month (for every job). For the months worked, we however do not know the number of days worked. The EICV3 is more precise: in EICV3, the respondent is asked the number of months s/he worked in the preceding 12 months (not on a month-by-month basis), split by high and low season (in case of seasonality), and also the number of days worked per month (in the high and low season). This is a potential cause for concern: since we do not have data on the number of days worked per month in the EICV2 survey, we are likely to overestimate the days worked in EICV2 and hence the decrease in working hours we document in the study may just be due to differences in questionnaire design. Other data however corroborate the decline in working hours. The EICV2 and EICV3 use the exact same question to ask for the number of hours worked in the past 7 days (on a day-to-day basis), and median hours worked decreased from 26 in EICV2 to 24 in EICV3.

### Annex 3: Oaxaca-Blinder decomposition of earnings differentials

To examine whether differences in earnings between two groups (for instance, men vs women or formal vs informal) are due to differences in characteristics across groups or rather different returns to characteristics, we use the traditional Oaxaca-Blinder decomposition method. The Oaxaca-Blinder method decomposes the differences in earnings (in our case) between two group into a part that can be explained by differences in characteristics (the explained part) and a part that cannot be explained by those differences (the “unexplained” part or the part due to differences in coefficients). In a stylized fashion:

$$\ln(E_i) - \ln(E_j) = [\alpha(X_i) - \alpha(X_j)]\beta_{pooled} + \alpha(X_i)(\beta_i - \beta_{pooled}) + \alpha(X_j)(\beta_{pooled} - \beta_j)$$

Where  $\ln(E_i) - \ln(E_j)$  is the difference in log earnings between group  $i$  and group  $j$ . The first term in the equation,  $[\alpha(X_i) - \alpha(X_j)]\beta_{pooled}$ , is the part of the difference that is due to differences in characteristics (the  $X$ 's) between groups (the explained part). The second term,  $\alpha(X_i)(\beta_i - \beta_{pooled}) + \alpha(X_j)(\beta_{pooled} - \beta_j)$ , is the part that is due to differences in returns the characteristics between groups (the unexplained part). Related to the labor market, a big unexplained part means that two otherwise identical workers get remunerated differently based on the group or sector they belong too, which is indicative of labor market segmentation.

The first earnings decomposition compares the earnings of the public and the formal private sector. Employment in these sectors is considered good “modern” wage employment, the kind of employment most Governments aim to stimulate. Earnings in the public sector are higher than those in the formal private sector, and the bulk of the difference can be explained by public sector employees’ better skills. 80 percent of the earnings differential between the public and private formal sector is explained by differences in characteristics, mainly the higher educational attainment and older age (experience) of public sector workers<sup>54</sup>. In contrast, the unexplained part is small and not statistically significant.

**Annex Table 1: Oaxaca-Blinder decomposition of earnings differentials**

	Coefficient	P-value	% of total difference
<b>Public vs private formal</b>			
Net difference	0.236	0.000	
Explained	0.187	0.000	79.2%
Unexplained	0.049	0.395	20.8%
<b>Private formal vs private informal</b>			
Net difference	0.657	0.000	
Explained	0.406	0.000	61.8%
Unexplained	0.251	0.000	38.2%
<b>Men vs women</b>			
Net difference	0.262	0.000	
Explained	0.06	0.000	22.9%

<sup>54</sup> The characteristics included in the decompositions are education, sex (except in the men vs women decomposition), age and age squared, and urban vs rural location.

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Unexplained	0.202	0.000	77.1%
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Source: EICV3. World Bank staff calculations

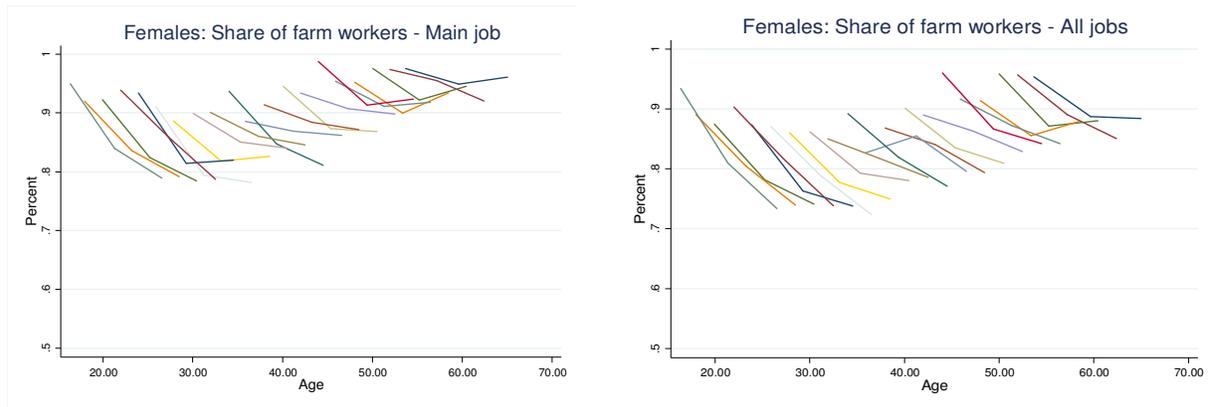
Different returns to characteristics do however explain a significant part (38 percent) of the earnings differential between the formal and informal private sector. In particular, workers in the informal sector have significantly lower returns to education.

Earnings differences between men and women are largely unexplained. Close to 80 percent of the earnings differential between men and women are not due to their different characteristics (for instance, the higher educational attainment of men), but due do different returns on those characteristics. This can largely be explained by women's overrepresentation in subsistence agriculture and self-employment, and their large underrepresentation in wage employment in the nonfarm sector.

## Annex 4: Chapter 2

**Annex Figure 1: Women are moving off the farm too, but much slower than men**

*(Share of women with a job in farming, by cohort and period)*



Source: EICV, 2001; 2006; 2011. World Bank staff calculations

## Annex 5: Pseudo-panel estimation

The lack of panel data has led to the development of so-called pseudo-panel techniques, initiated by Deaton (1985). A pseudo-panel is formed by creating synthetic observations by averaging real individual observations with similar characteristics (birth-year, sex, etc.) in a sequence of repeated cross-sectional data. Thus, the synthetic units of observations can be followed over time. Pseudo panels do not suffer from sample attrition because the samples are renewed every period. Averaging over individual observations eliminates individual heterogeneity and reduces issue of measurement errors.

The main drawback of pseudo-panels relates to the choice of clustering individual observations that carries with it an important trade-off between the number of cohorts and the number of observations in each cohort. The larger the number of cohorts, the smaller the number of observations in each cohort, thus questioning the representativeness of the aggregation exercise and its capacity to provide good estimates of the population cohort means. On the other hand, having a larger number of cohorts is definitely a big advantage so that the estimates based on the synthetic observation suffer less from small sample problems.

In the case at hand, the synthetic observations are created by combining year of birth and gender of the individuals observed in the three cross-sections (EICV 1, EICV 2, and EICV3). This choice provides 40 synthetic observations for each cross-section (120 observations overall), and each synthetic observation is based on a sufficiently large number of individual observations (between 100 to 700 observations).

Since the number of observations per cell varies substantially, the error term is heteroskedastic leading to biased standard errors. Heteroskedasticity is corrected by using weighted least squares estimation, i.e. by weighting each cell with the square root of the number of observations in each cell.

The estimated equation is the following:

$$Y_{ct} = \beta Y_{c,t-1} + \gamma X_{ct} + \alpha_{ct} + \epsilon_{ct}$$

$\alpha_{ct}$  is the average of the fixed effects for the individuals in cohort  $c$  in survey year  $t$ . Therefore,  $\alpha_{ct}$  is not constant over time because the samples are collected individually at different times. As a consequence  $\alpha_{ct}$  might be correlated with  $Y_{c,t-1}$ . However, it can be treated as the true cohort effect ( $\alpha_{ct} \approx \alpha_c$ ) if the sample size in each cohort is sufficiently large. Verbeek and Nijman (1992, 1993) find that cell sizes greater than 100 observations per cell are sufficient to nearly eliminate the bias.

Annex Table 2 shows the estimation of the pseudo-panel regression based on cohorts formed by year-of-birth and gender. Due to the small sample size, only two explanatory variables have a statistically significant effect on the ratio of non-farm to farm jobs: education at the complete secondary level or beyond and the lagged ratio of nonfarm to farm jobs. Education of a cohort is positively related to a higher share of nonfarm jobs in that cohort, with the effect becoming stronger for each successive level of education. The significant positive effect of the lagged ratio

indicates that the move to non-farm jobs is persistent: The higher the share of a cohort that is employed outside agriculture in year  $t$ , the higher the share of that cohort employed outside agriculture in year  $t+1$ . Unsurprisingly, being located in urban areas is positively associated with having a non-farm job. The estimated cohort effect ( $\alpha_{ct}$ ) indeed indicate that youths are leading the move to nonfarm employment: the ratio of nonfarm to farm jobs increases with each age cohort, both for men and women (Annex Figure 2).

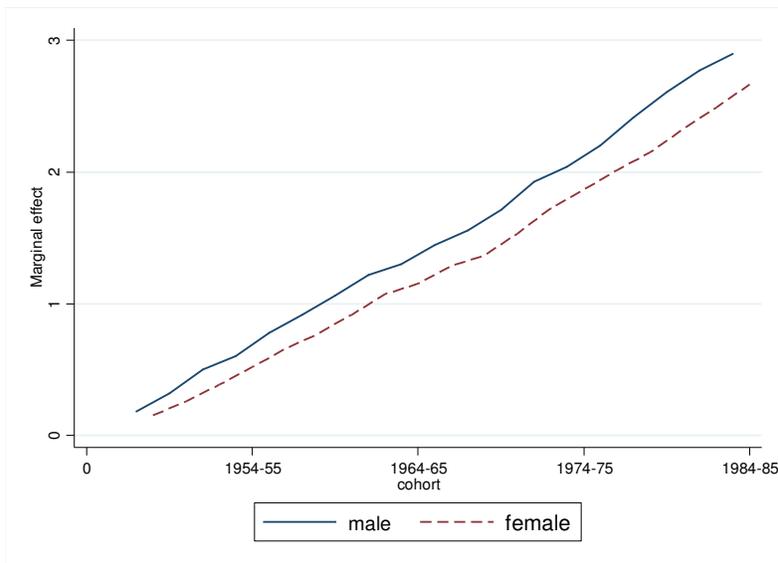
**Annex Table 2: Pseudo-panel estimates of ratio of nonfarm workers to farm workers**

Dep. Var. : Ratio nonfarm to farm workers	coef/se
<b>Lag ratio</b>	0.317**
	(0.115)
<b>Demographics</b>	
Age	8.315
	(13.003)
Age squared	-1.658
	(1.372)
Male	-0.006
	(0.134)
Married	-0.048
	(0.109)
Urban	0.541
<b>Educational level</b>	
Incomplete primary	0.020
	(0.322)
Complete primary	0.297
	(0.442)
Post-primary/Incomplete secondary	0.554
	(0.484)
Complete secondary or higher	1.544*
	(0.806)
	(0.336)
<b>At least two jobs last year</b>	0.105
	(0.159)
Constant	-4.385
	(7.882)
R-squared	0.990
Number of observations	80
note: reference category - education=no schooling.	
legend: .01 - ***, .05 - **, .1 - *;	

Source: EICV, 2001; 2006; 2011. World Bank staff calculations

**Annex Figure 2: Estimates of birth cohort dummies**

*(Effect of birth cohort on the ratio of nonfarm to farm occupations, marginal effect )*



Source: EICV, 2001; 2006; 2011. World Bank staff calculations

## Annex 6: Employment transitions

### Annex Figure 3: Men have also taken up farm wage employment, though slower than women

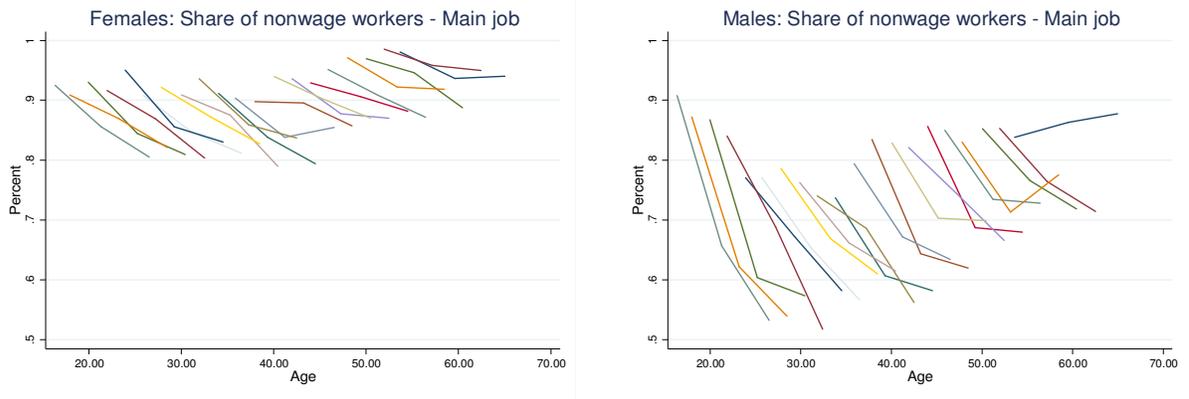
(Share of men with a job in wage farming, by cohort and period)



Source: EICV, 2001; 2006; 2011. World Bank staff calculations

**Annex Figure 4: The transition to wage work is driven by young men**

*(Share of people with a main job in nonwage employment, by cohort and period)*



Source: EICV, 2001; 2006; 2011. World Bank staff calculations

## Annex 7: Forward-looking Shapley Decomposition

The Shapley method decomposes per capita output growth into four components - contributions of productivity growth, employment growth, labor force growth, and change in working age population. The aim of the analysis is to understand the roles of productivity and employment growth in driving a country's overall growth. The method also calculates different sectors' contributions to aggregate productivity and employment growth.

While the Shapley decomposition is typically conducted on historical data-in order to better understand past output growth-it can also be applied in a forward-looking fashion to get projected insights into the composition of future per capita output growth. To enable the forward-looking decomposition, projections and assumptions must be made about (i) overall economic growth, (ii) sectoral growth, and (iii) population growth and age-structure. In the baseline scenario presented in chapter 4, following assumptions are made:

- i. Economic growth: The economy will grow at its average potential growth rate of 7.8 percent per year between 2011 and 2020;
- ii. Sectoral growth:
- iii. Population growth and age-structure: We use the population projections of the UN's World Population Prospects (medium fertility scenario);
- iv. Sectoral growth: Agriculture is projected to grow at 5.1 percent per year, industry at 10.4 percent and services at 8.5 percent.
- v. Constant productivity growth (same productivity growth as in 2006-2011);

The model than projects employment based on the underlying assumptions. In the baseline scenario, employment in industry and services would increase substantially while employment in agriculture would grow modestly (in absolute terms – see Annex Table 3). Productivity would grow in agriculture, manufacturing, and most services, but would decline in mining and construction, two sectors that are expected to grow rapidly in terms of employment.

**Annex Table 3: In the baseline scenario, nonfarm employment will grow substantially...**

*(Projected number of workers by sector, 2020, thousands)*

	2011	2020
Total Employment	4,961	7,143
Agriculture	3,596	4,001
Mining & Utilities	58	332
Manufacturing	112	205
Construction	146	610
Wholesale & Retail	467	1,005
Transport & Communications	91	218
Other Activities	491	771
Agriculture	3,596	4,001
Industry	316	1,147
Services	1,049	1,995

**Annex Table 4: And productivity will increase in agriculture, manufacturing and services**

*(Productivity – million 2011 Rwf per 1,000 workers)*

	2011	2020
Total Productivity	723	985
Agriculture	346	488
Mining & Utilities	1,672	714
Manufacturing	1,830	2,440
Construction	1,705	998
Wholesale & Retail	1,251	1,210
Transport & Communications	1,989	1,730
Other Activities	2,092	2,774
Agriculture	346	488
Industry	1,744	1,174
Services	1,708	1,872

Source: World Bank staff calculations

