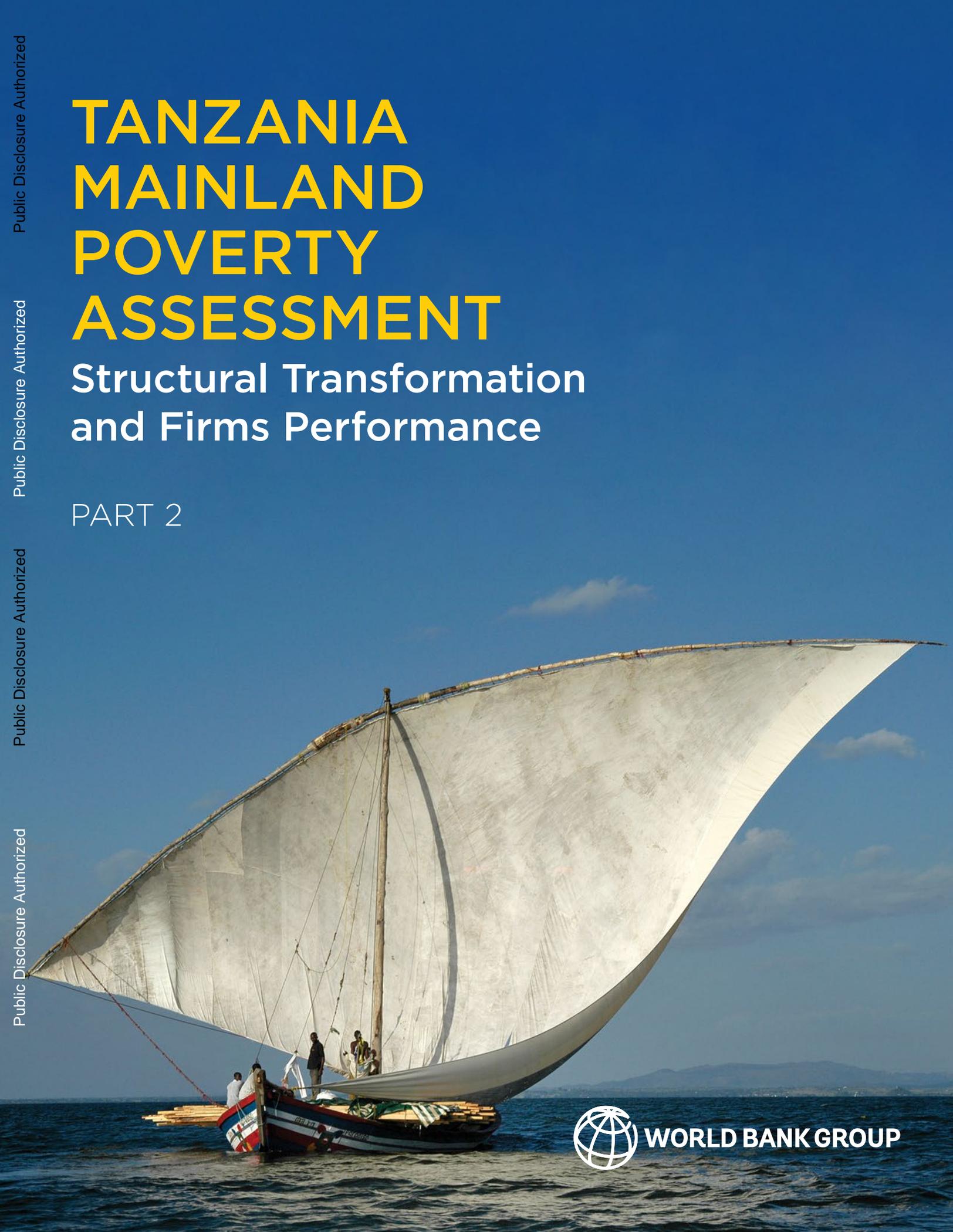


TANZANIA MAINLAND POVERTY ASSESSMENT

Structural Transformation and Firms Performance

PART 2



WORLD BANK GROUP

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TANZANIA MAINLAND POVERTY ASSESSMENT

Structural Transformation and Firms Performance

PART 2

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Key Findings

Structural transformation

Tanzania recorded strong economic growth over the past decade, particularly in non-agricultural sectors, slowly transforming the economy's structure. Growth in gross domestic product (GDP) averaged 6.3 percent per year since 2007. Between 2013 and 2017, the compounded yearly growth rate was 6.7 percent, dropping to 3.4 percent when adjusted by population size. The fast-paced growth of industry and services has transformed the structure of the economy, even though all sectors continue to be supply-side drivers of growth. On the demand side, economic growth was primarily driven by private consumption and investment; public consumption is modest. Finally, growth accounting disaggregation shows that capital accumulation is the main driver of growth, followed by an expansion of the labor force.

However, transformation of the labor market's structure was slower. Despite the sectoral shift from agriculture to manufacturing and services, employment transitions

across sectors have been limited. Overall, over 60 percent of the employed labor force still works in agriculture, and high-growth sectors have not witnessed complementary employment shifts. The transition away from agriculture seems slightly faster when based on hours worked by sector. For instance, accounting for total hours worked in each sector, agriculture accounts for less than half of total hours worked. More importantly, even when agriculture is the main sector of employment, workers supply a considerable amount of time to nonfarm sectors.

Accelerating the transition of labor away from agriculture can potentially generate sizeable productivity gains. Labor productivity is markedly higher in industry and services as compared to agriculture, suggesting that a faster sectoral transition can increase the overall productivity of the economy. In a more granular disaggregation, mining, transport, and trade are the most productive sectors in Tanzania.

Firms' profile

The majority of Tanzanian firms are small and young, but employment is primarily concentrated in large and older firms. Firms' landscape is primarily occupied by micro and small-scale businesses, as well as young companies, operating in the manufacturing or trade sectors. Informality is also widespread, particularly among younger and smaller firms. However, employment is disproportionately concentrated in older firms, and strongly skewed towards nonmarket services and manufacturing, followed by trade. Overall, net job creation over the period 2010-13 was positively correlated with firm age and firm size.

Large firms employ qualified workers and contribute more to total value-added. Large industrial firms contribute twice as much to value-added as medium industrial firms, and about 20 times more than micro industrial firms. Nevertheless, shortage of qualified labor constitutes to

be a severe barrier to the growth of larger firms. Overall, smaller and younger firms employ a higher proportion of unskilled labor: the share of skilled employees among the workforce of large and older firms is nearly twice that in small and young firms. In terms of sectors, food and beverages and wood processing account for the largest share of employment of unskilled workers.

There is considerable regional variation in firm location and employment patterns, and this tends to be correlated with the distribution of poverty across the country. More than one-fourth of businesses are concentrated in the Eastern zone, where Dar es Salaam is located. The city, which constitutes the main commercial and administrative hub of Tanzania, hosts 25 percent and 39 percent of medium and large businesses respectively, including most manufacturing firms. Consequently, jobs are concentrated

in the Eastern zone, which accounts for 30 percent of all jobs. There is strong evidence of a negative and statistically

robust correlation between the incidence of poverty and the number of businesses at both regional and district levels.

Access to finance

Financial inclusion in Tanzania remains limited. A large part of the population continues to lack any formal financial tool – namely the ownership of a formal bank account, the possession of formal savings, and the access to credit provided by a formal financial institution. Financial inclusion is strongly determined by socio-economic characteristics. On average, older, better-off, and educated males are more likely to be financially included than young, uneducated, and poor women. In particular, education and wealth appear as very significant factors when explaining financial inclusion. Meanwhile, structured forms of savings, whether formal or informal, remain scarce and subject to socio-economic factors. Finally, access to credit is achieved primarily through informal arrangements – namely relatives and saving clubs.

Nevertheless, financial inclusion has progressed rapidly over the last years, primarily driven by the development of mobile banking and the increase of remittances.

Between 2014 and 2017, the share of the population with mobile bank accounts increased by 6 percentage points (pp), with fast increases recorded in vulnerable groups

of the population – low-educated individuals or belonging to poorest households. Remittances have been the underlying driving force as mobile banking constitute the primary channel to send or receive transfers – 41 percent of the population used mobile banking either to receive or send remittances, while only 1.5 percent used regular bank accounts, 5.5 percent used other forms of transfer such as cash.

Firms' owners perceive financial access as a major constraint, but evidence does not show a significant impact of financial constraint on firms' growth. Tanzania's formal firms perceive access to finance as a major and increasingly important obstacle, in particular for smaller firms. More specifically, a third of industrial firms feel financially constrained, while only one tenth of informal household enterprises have access to credit, which primarily comes from micro-credit entities or informal credit channels. However, data and econometric models show that the growth of Tanzanian firms does not appear to be significantly affected by financial constraints.

Economic choices by socially embedded individuals

Data on Household Enterprises (HE) raises several fundamental questions on their structure and their operations.

Survey data shows that the major part – 80 percent—of the money borrowed to fund HEs comes from informal sources, bearing the question of the implications for the efficiency of these enterprises. Meanwhile, only a minority of HEs' owners – around 10 percent—participate in Rotating Savings and Credit Associations (ROSCA), but 80 percent

of HEs' owners believe that ROSCAs have or could have a positive impact on their businesses. It leads to the following questions: Is it possible to build on the current functioning of ROSCAs in order to enhance their ability to channel informal credit, both at the intensive and at the extensive margin? And what explains the fact that individuals in Tanzania resort more to borrowing and lending through relatives, friends, and neighbors, rather than through ROSCAs?

CHAPTER 1

Structural Transformation



I. Economic Growth and Structural Transformation

Tanzania’s economic growth has been robust since 1999, with the economy growing at a steady compounded rate of 6.3 percent annually. The figures are based on the new National Accounts series with a base year of 2015, released in February 2019. Between 2013–17, the compounded growth

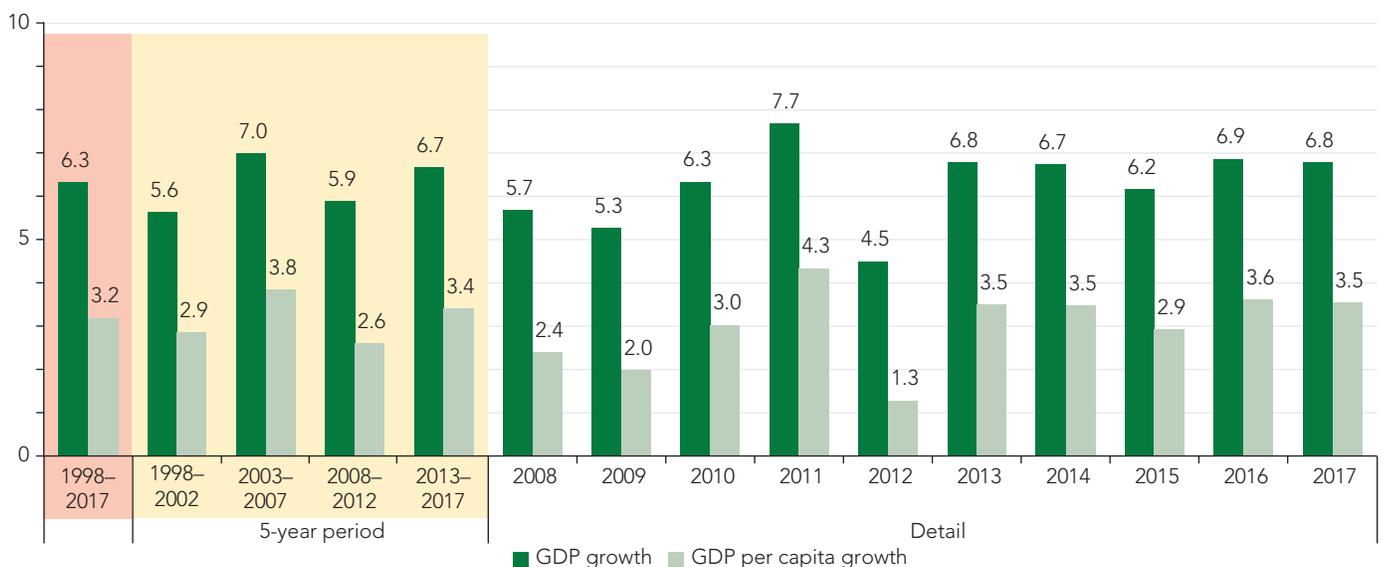
rate was at 6.7 percent (Figure 1.1). When adjusted for the growth in population, Tanzania’s GDP per capita grew by 3.2 percent annually from 1999 to 2017, and by 3.4 percent for 2013–17.

The fast-paced growth of industry and services sector has transformed the structure of the economy, even though all sectors have been and are supply-side drivers of growth.

The economy has gradually entered a sectoral transformation characterized by a decrease in the weight of agriculture and an increase in that of industry and to a

lesser extent services. While in 1998 agriculture accounted for 40 percent of GDP, in 2017 it was down to 28 percent, with the decline being gradual but steady over the last two

FIGURE 1.1: GDP Growth, 1999–2017, Percent



Source: National Accounts, base year 2015. Tanzania National Bureau of Statistics (NBS) February 2019.

decades (Figure 1.2A). Meanwhile, the weight of industry in GDP rose to 29 percent and of services to 43 percent. Though services account for the largest share of GDP, since 1999 their contribution to the economy went up by just 3 pp. Industry, in contrast, has grown much faster, increasing its contribution to GDP by more than 50 percent. The curves for industry and agriculture crossed in 2016, when both accounted for 28 percent of Tanzania’s economy.

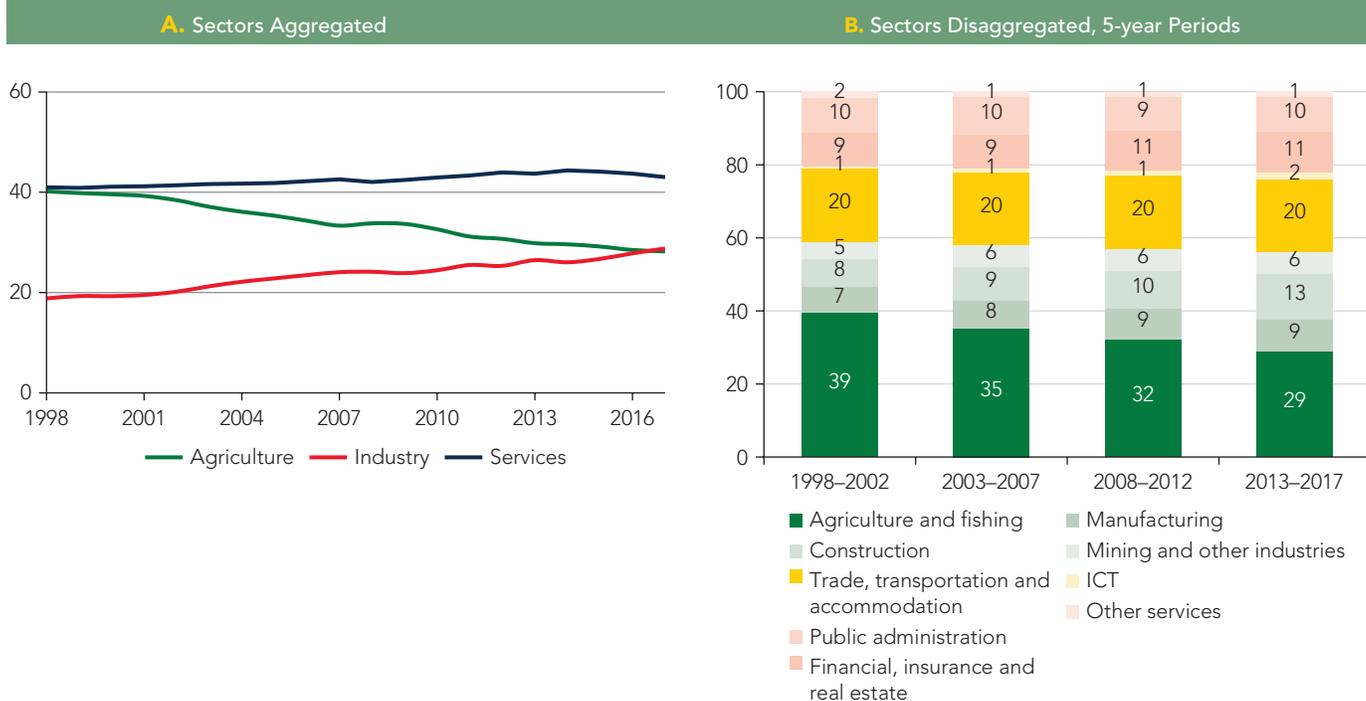
The primary beneficiaries of this structural shift were the construction, manufacturing, financial, insurance, and real estate subsectors. From 1998 to 2017, the weight of construction in GDP doubled from 7 to 14 percent (Figure 1.2B); over the last decade, its weight gained 4 pp. Meanwhile, manufacturing, financial, insurance, and real estate each gained 2 pp in GDP and the contribution of ICT went up by 1 pp.

The transformation in Tanzania’s economy was due not so much to agricultural decline as to relatively higher

growth in other sectors. The steady decline in the relative contribution of agriculture to GDP did not result from sectoral loss of value—throughout the period agricultural output kept growing. For instance, between 2013 and 2017, its annual compounded growth rate was 4.9 percent. It also supported the growth of the whole economy, contributing 1.3 pp in 2016 and 1.6 pp in 2017 (Figure 1.3B). However, with other sectors of the economy growing faster, the relative weight of agriculture declined. For 2013–17, industry grew at a 9.4 percent annual compounded rate, and services at 6.2 percent.

Growth in industry followed by services sectors allowed Tanzania to maintain high GDP growth in 2016 and 2017. Until 2016, services were the primary driver of growth, contributing about 2.8 pp annually in 2008–16, but in 2016 industry took the lead—primarily due to the construction subsector, which contributed about 1.7 pp to overall economic growth in 2016 and 1.9 pp in 2017 (Figures 1.3A and B).¹

FIGURE 1.2: Contribution of Economic Sectors to GDP, 1998–2017, Percent

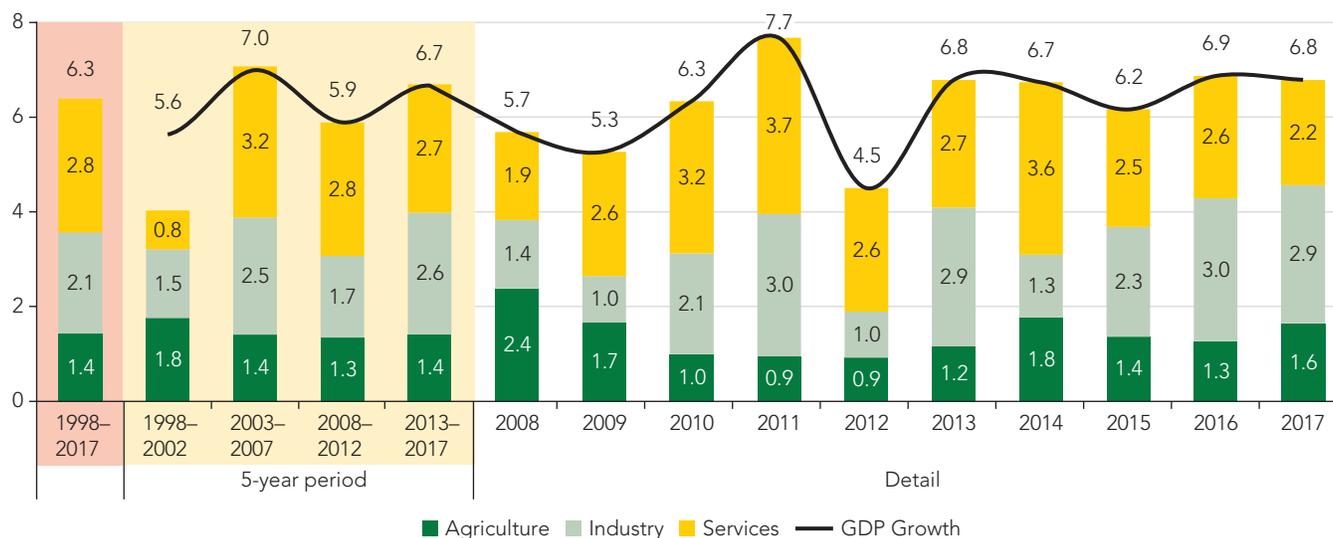


Source: National Accounts, 2019.

¹ In other words, construction drove national growth by 25 percent in 2016 and 28 percent in 2017.

FIGURE 1.3: Contribution of Supply-side Factors to GDP Growth, 1998–2017, Percent and Percentage Points

A. Contributions of sectors to economic growth, Percent and PP



B. Contributions of subsectors to economic growth, PP

	1998–2017	1998–2002	2003–07	2008–12	2013–17	2013	2014	2015	2016	2017
Agriculture & fishing	1.4	1.8	1.4	1.3	1.4	1.2	1.8	1.4	1.3	1.6
Manufacturing	0.6	0.4	0.7	0.6	0.7	0.4	0.8	0.5	0.9	0.7
Construction	1.0	0.6	1.1	0.8	1.6	2.2	0.2	1.4	1.7	1.9
Mining & other industries	0.5	0.5	0.7	0.3	0.4	0.4	0.4	0.4	0.4	0.3
Trade transp. & accom.	1.2	1.1	1.4	1.2	1.1	1.1	1.6	0.7	1.0	1.1
ICT	0.2	0.0	0.2	0.3	0.1	0.2	0.2	0.1	0.0	0.1
Financial ins. & real estate	0.8	0.5	0.8	0.9	0.7	0.6	1.0	0.9	0.7	0.4
Public administration	0.6	0.7	0.8	0.4	0.6	0.5	0.7	0.7	0.6	0.4
Other services	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
GDP GROWTH	6.3	5.6	7.0	5.9	6.7	6.8	6.7	6.2	6.9	6.8

Source: National Accounts, 2019.

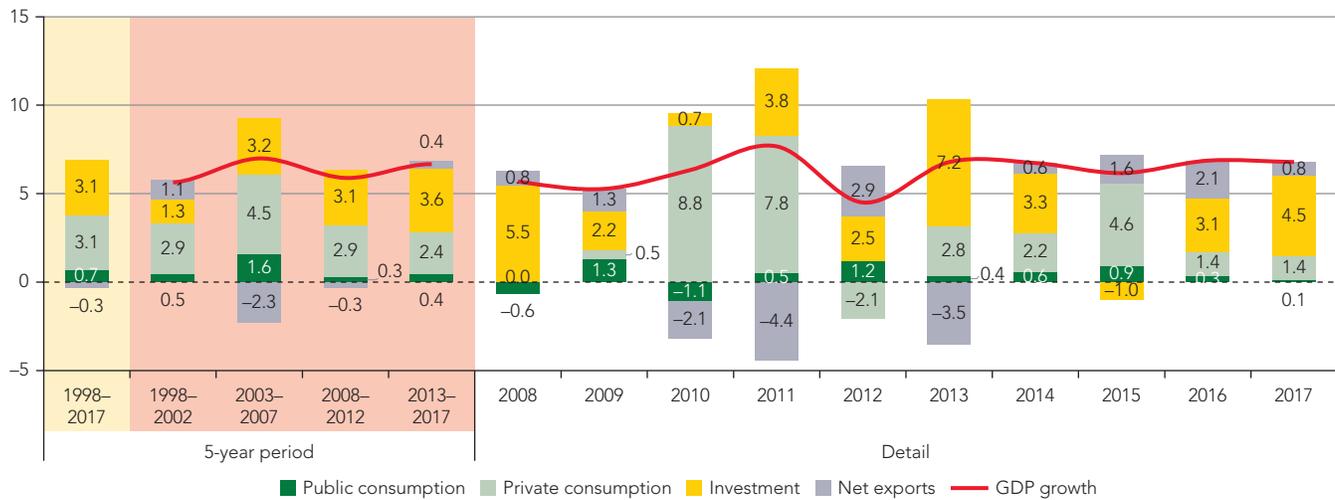
On the demand side, economic growth is primarily driven by private consumption and investment; public consumption is modest.

Over the last two decades, private consumption and investment each contributed 3.1 pp to growth; now, services exports are also supporting growth.

Between 2013 and 2017, private consumption contributed 2.4 pp to economic growth, accounting for 35 percent of total GDP growth, and investment contributed 3.6 pp to GDP growth, accounting for 52 percent (Figure 1.4). Recently, the export-import profile has shifted. Tanzania continues to run a considerable trade deficit, mainly

because of high goods imports, but the recent shift has been characterized by a lower value of imports and a higher value of exports. Between 2013 and 2017, exports of services grew at an annual compounded rate of 6.8 percent while imports of services fell by 5.3 percent. The resulting progressive reduction of the trade deficit drove up economic growth. For instance, the reduction of the trade imbalance contributed 2.1 pp to GDP growth in 2016 and 0.8 pp in 2017.

FIGURE 1.4: Demand-side Contributions to GDP Growth, 1998–2017, Percentage Points



Source: National Accounts, 2019.

Capital accumulation is the main driver of growth, followed by expansion of the labor force.

Capital accumulation accounts for most of Tanzania’s real economic growth, which relates to the high investment rate previously noted. The rate of capital accumulation has been steady. In 2013–17

it contributed on average 4.4 pp a year to economic growth, 67 percent of the total; and for 2008–12 its contribution averaged 4.5 pp, which constitutes 75 percent of total growth (Figure 1.5).²

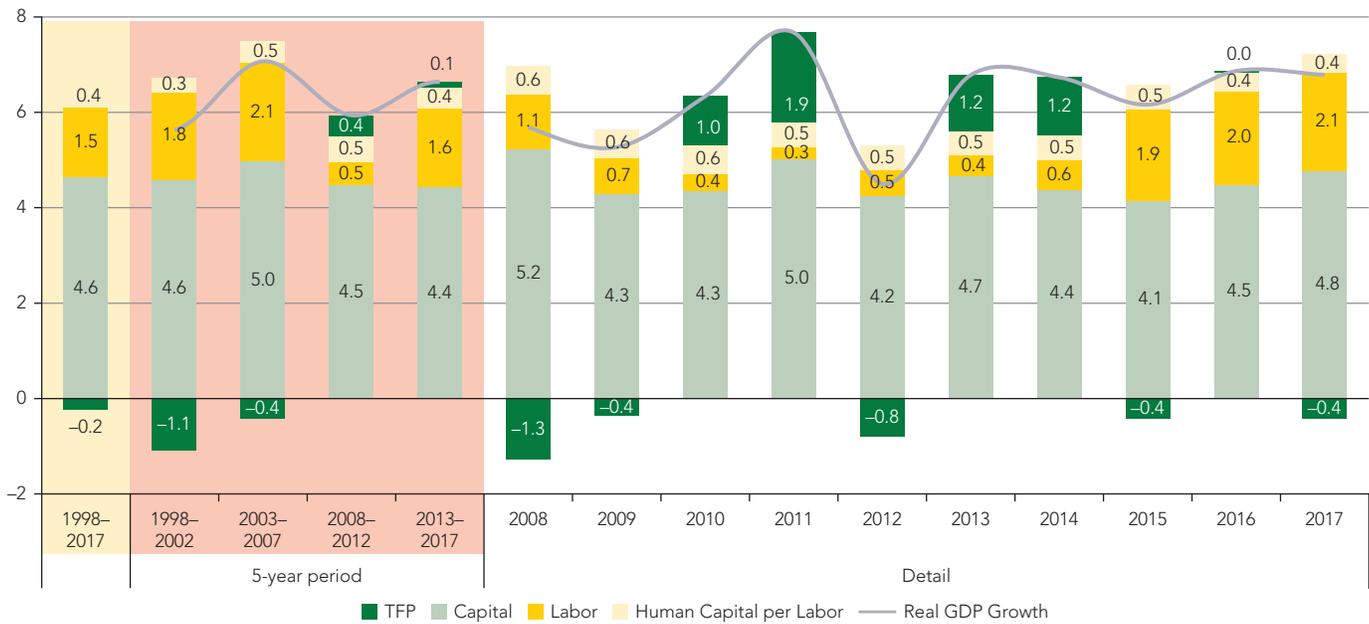


² The results are based on the decomposition of economic growth using the Solow growth accounting model.

Additional workers also helped fuel growth, although total factor productivity (TFP) is still low. In 2016, labor contributed 2 pp to economic growth and in 2017, this was 2.1 pp. Over 2013-17, added units of labor—mostly new young workers entering the labor market—contributed 1.6 pp, 25 percent of total growth. Human capital—proxied

by average years of schooling weighted by the return on education—has also been contributing to growth, indicating constant progressive, though very slow, improvement in the quality of the workforce over the last 20 years. Conversely, TFP is still low, contributing negatively in 2017 and averaging only 0.1 pp for 2013–17.

FIGURE 1.5: Growth Accounting Decomposition, 1998–2017, Percent and Percentage Points



Source: National Accounts, 2019, and World Bank staff calculations.



II. Labor Market Transformation

Microeconomic structural transformation was significantly slower than macroeconomic transformation.

The employment pattern is slowly transitioning from agriculture to services and industry. Integrated Labor Force Surveys (ILFS) show that between 2006 and 2014, employment in agriculture fell from 76 to 67 percent. Labor appears to be slowly shifting to services, where employment went up by 9 pp, and to a lesser extent industry, up by 1.2 pp (Figure 1.6). Within services, employment rose most in the restaurants and accommodation subsector, followed by transport and communication, and wholesale and retail trade. In industry, mining and quarrying followed by construction are the subsectors where jobs increased the most. However, they still account for a very small share of total jobs. Moreover, the decline in agricultural jobs is significantly lower than the decline in agriculture's contribution to GDP.

The shift away from agriculture also appears to be slow when using household surveys. Information about the primary jobs of individuals gleaned from the Household Budget Surveys (HBS) of 2012 and 2018 indicate a decline of employment in agriculture from 75 to 58 percent and increase of employment in services and industry by, respectively, 12 pp and 4 pp. The share of household heads employed in agriculture fell by 9.6 pp as the share in services rose by 4.1 pp and in

industry by 5.5 pp. Thus, more households members seem to have moved out of agriculture than households heads, probably due to the increase of education among the younger generation. National Panel Surveys (NPS) of 2011 to 2015 corroborate the shift of labor away from agriculture, but the decline was more modest, from about 72.7 to 70.8 percent. Industry gained about 1.4 pp and services about 0.5 pp, from 22.5 to 23 percent (Figure 1.7). The proportion of household heads working in agriculture fell by about 4 pp as the share in services rose by 2.4 pp and in industry by 1.6 pp. In contrast with HBS, NPS data suggest that household heads are leading the way out of agriculture.

Yet employment in the sectors driving economic growth is still very low. The 2018 HBS shows that the industry share of labor is 6.9 percent and services 34.8 percent. For household heads, an estimated 54.3 percent are employed in agriculture, 9.1 percent in industry, and 36.5 percent in services. A similar pattern emerges from the 2015 NPS, though the labor share in agriculture is higher. Employment in industry is estimated at 6.2 percent, and in services at about 23 percent. Household head shares are 61.2 percent in agriculture, 8.5 percent in industry, and 30.3 percent in services.³

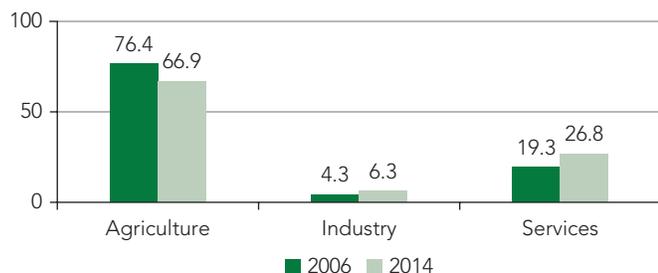
The transition away from agriculture seems faster when based on hours worked by sector.

Accounting for total hours worked in each sector, agriculture consumes less than half of Tanzanian work hours. Measures based on hours worked in primary and in secondary jobs provide a more accurate picture by relaxing the assumptions that workers put in the same number of hours

no matter what the job and that they only have one job. Based on number of hours per job, the labor share of agriculture is a much lower at 46.3 percent, followed by services at 44.4 percent and industry at 9.3 percent (Figure 1.7A).

³ Data from the 2018 HBS cannot be used in analyzing structural transformation because there is no way to look at productivity by sector and changing pattern of employment over time; for these analyses NPS is more appropriate.

FIGURE 1.6: Labor Shares by Sector, 2006 and 2014, Percent



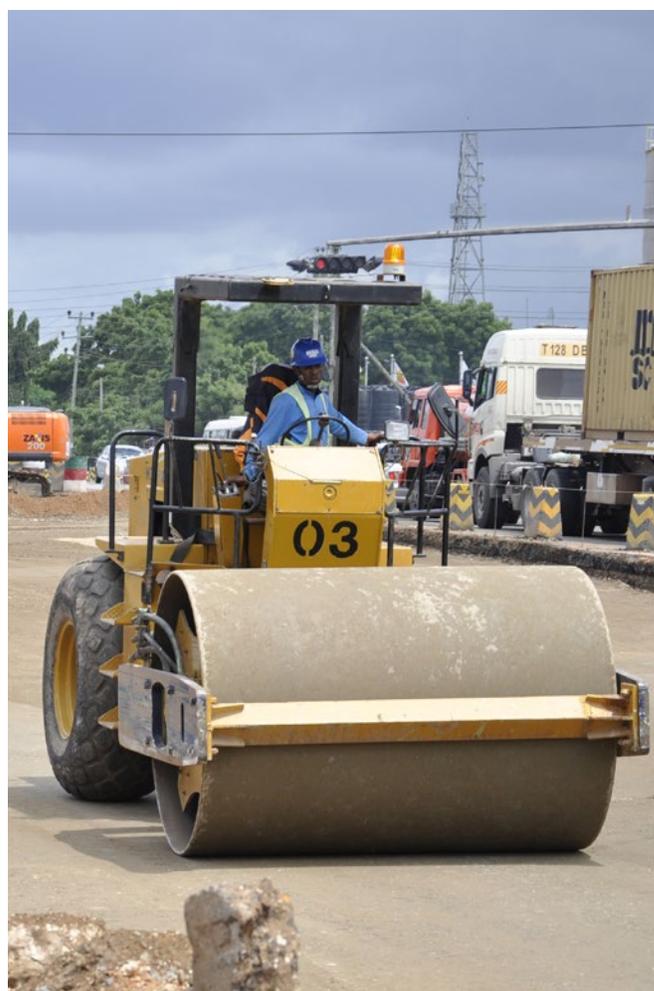
Source: ILFS 2006 and 2014.

	2006		2014		VARIATION (%)
	# OF JOBS	%	# OF JOBS	%	
Agriculture/ hunting/ forestry and fishing	12 719 757	76.4	13 400 163	66.9	5.4
Mining & quarrying	83 136	0.5	220 332	1.1	165.0
Manufacturing	432 305	2.6	620 934	3.1	43.6
Construction	182 898	1.1	420 633	2.1	130.0
Electricity, gas & water	16 627	0.1			
Wholesale & retail trade	1 263 662	7.6	2 543 828	12.7	101.3
Transport/storage & communication	249 407	1.5	520 784	2.6	108.8
Hotels & restaurants	332 543	2.0	781 175	3.9	134.9
Real estate/renting & business activities	99 763	0.6			
Public admin & defense	182 898	1.1	120 181	0.6	-34.3
Education	232 780	1.4	420 633	2.1	80.7
Health & social service	99 763	0.6	160 241	0.8	60.6
Other community/social & personal service activities	748 221	4.5	821 236	4.1	9.8
Total	16 643 760	100	20 030 139	100	20.3

Estimates based on hours worked in two jobs suggest a faster transition out of agriculture. Between 2011 and 2015, hours worked in agriculture declined from 58.3 to 46.3 percent (-12 pp) and rose in industry (+1.7 pp) and services (+10.3 pp); and services accounted for 44.4 percent of total labor input (Figures 1.7B and C).⁴ The transition was fastest between 2011 and 2013 and largely ascribable to secondary jobs, which changed far more than primary activities; however, it may also be attributable to a statistical artefact associated with changes in survey instruments.⁵ Services have been the main beneficiary of the exodus from agriculture: by 2015 service jobs had expanded by 28 pp and accounted for 36.4 percent of second jobs. Such changes are mirrored in the sectoral distribution of working hours. In 2011, about 63 percent of hours worked in secondary jobs were in agriculture, less than

9 percent in industry, and 28 percent in services (Figure 1.8). The new survey design (see Appendix A) changed the pattern drastically for 2015, during which 24.3 percent of total hours worked in secondary jobs were in agriculture, 9.4 percent in industry, and 66.4 percent in services (Figure 1.8).

Hours-based measures of structural change indicate faster movement out of agriculture even net of shifts in the share of secondary jobs, which were largely driven by changes in questionnaire design. Restricting the analysis to primary jobs to insulate the results from the questionnaire changes, between 2011 and 2015 jobs in agriculture declined from 58.1 to 49.1 percent, with most going to services (Figure 1.8). This confirms the idea that labor is not used intensively in agriculture, and workers there are likely to be underemployed.

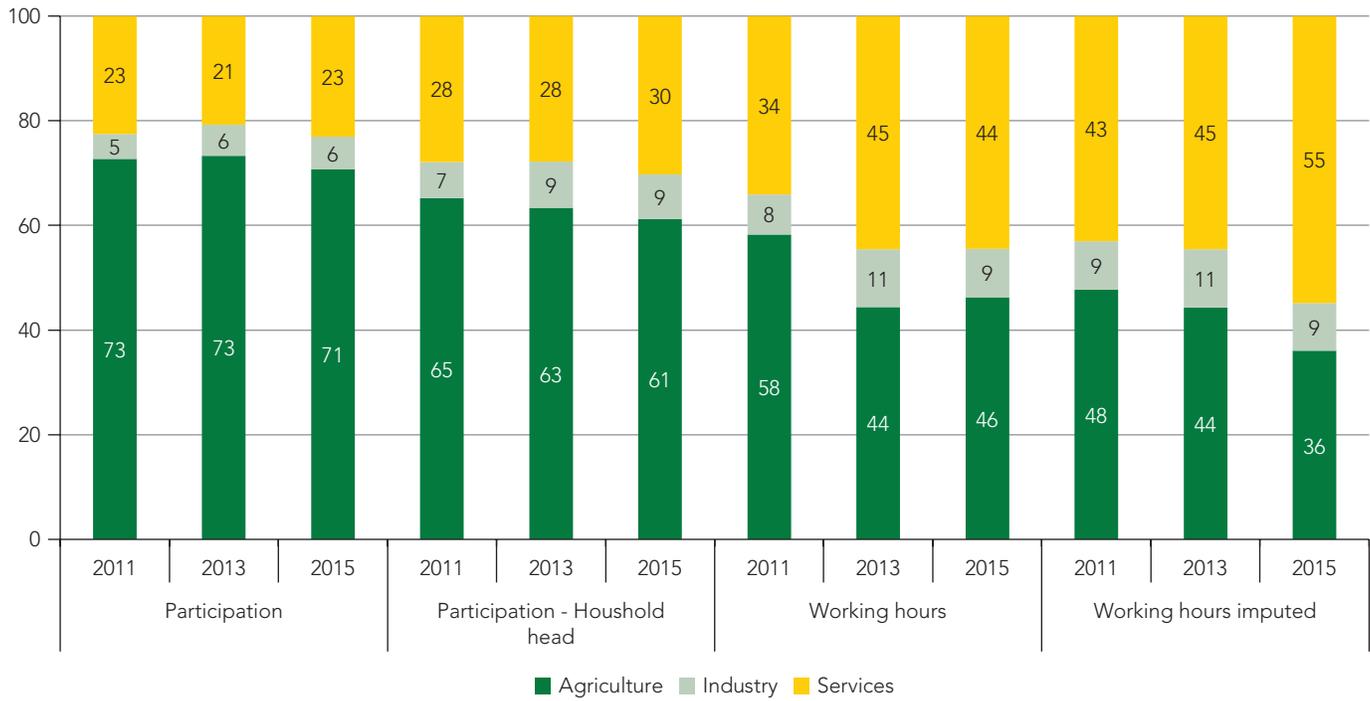


⁴ Measures based on hours worked in all jobs, with missing hours imputed, confirm movements of labor from agriculture to services. Estimated sectoral shares based on imputed working hours are smaller for agriculture and larger for services because more services values are missing. For example, in 2015, the agricultural labor share drops from 46 to 36 percent when imputed rather than reported hours are used, and labor supplied to services rises from 44.4 to 54.9 percent (see Appendix A).

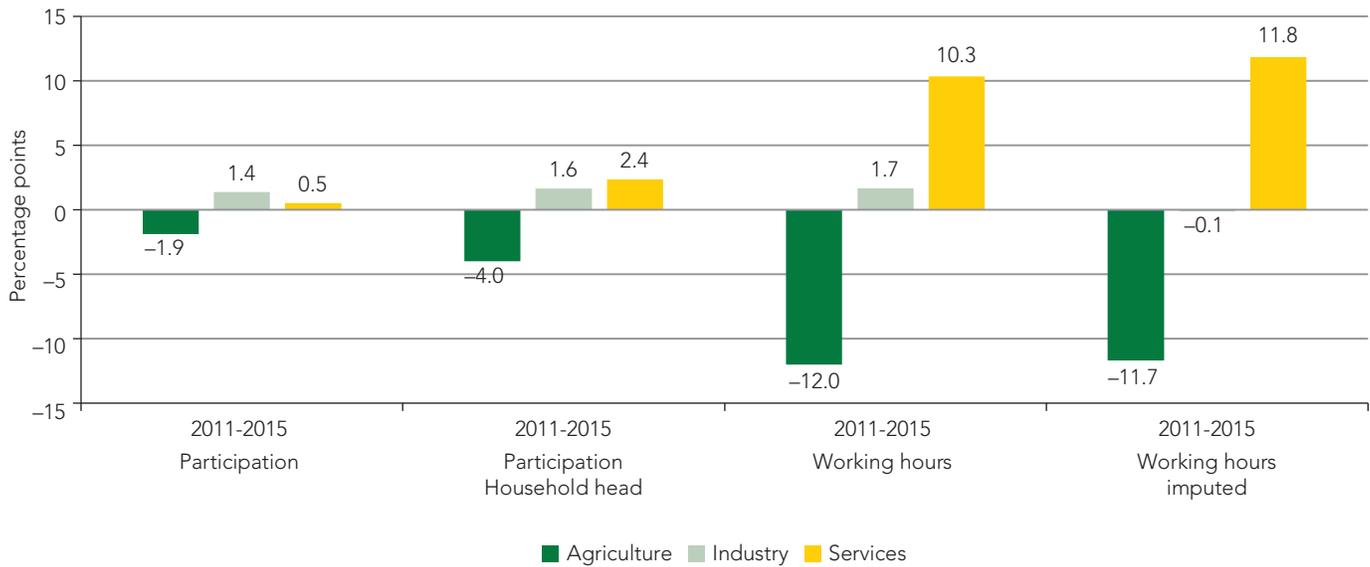
⁵ First, the number of workers with a second job doubled from 8.7 to 16.3 percent between 2011 and 2013, when the questionnaire was changed. Between 2013 and 2015, when the two questionnaires were similar, that percentage went up by less than 2 pp, from 16.3 to 18.1 percent. Second, the participation-based share of workers with a second job in agriculture declined from 51.1 percent in 2011 to 39.7 percent in 2015, bouncing back from a low of 36 percent in 2013. See Appendix A for more details.

FIGURE 1.7: Sectoral Labor Distribution, 2011–2015

A. Sectoral Employment Distribution, Percent

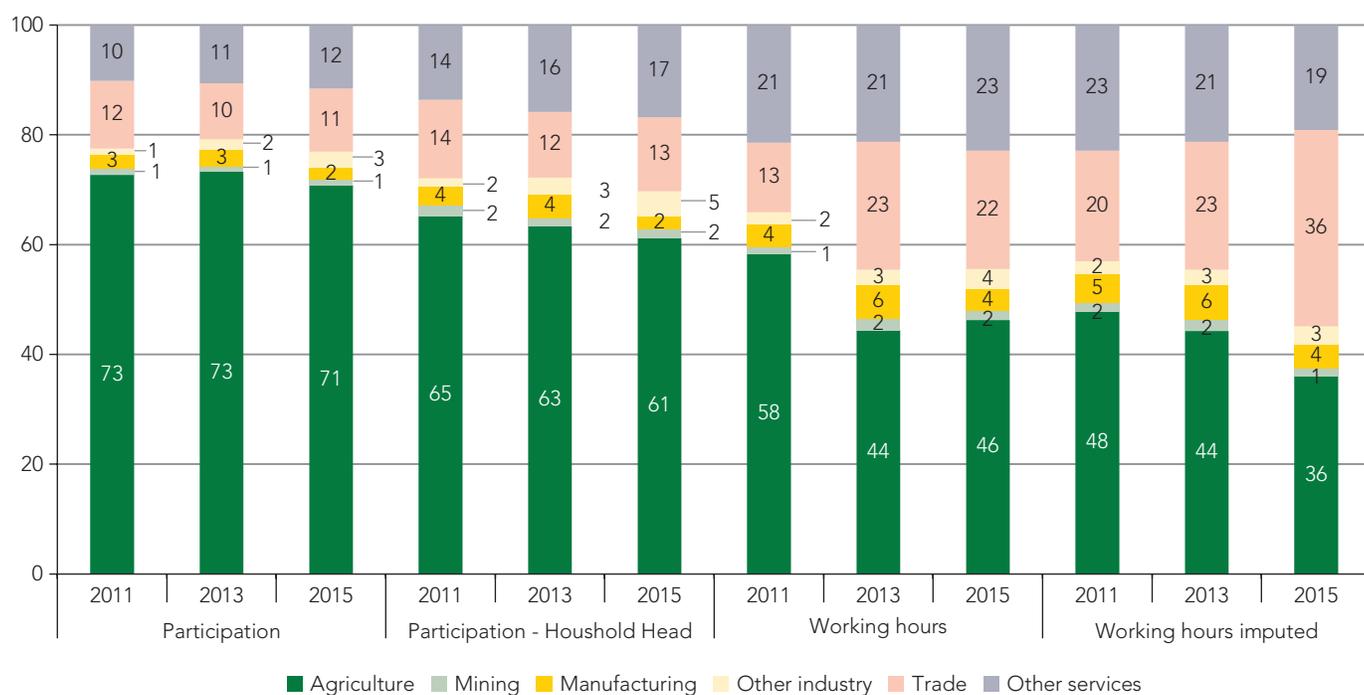


B. Cumulative Changes in Distribution of Labor, PP



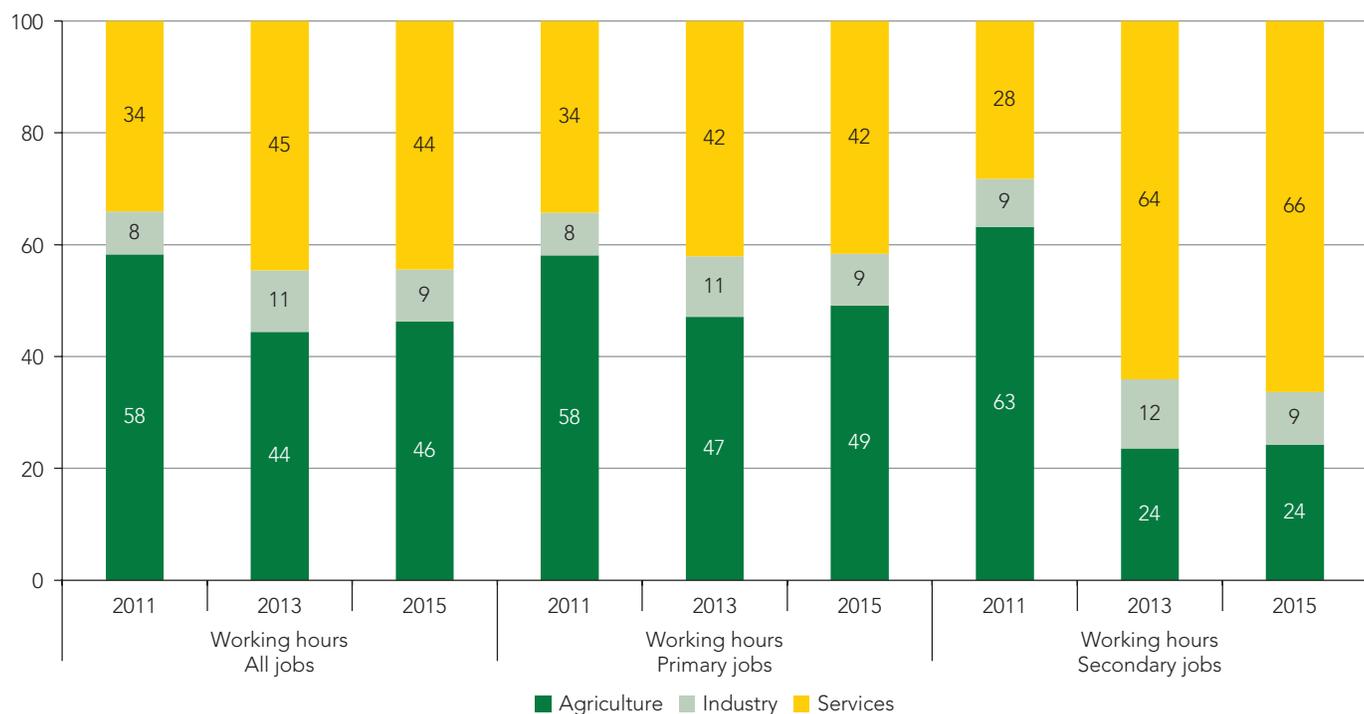
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FIGURE 1.7C. Detailed Sectoral Employment Distribution, Percent



Source: National Panel Surveys (NPS) 2010-11, 2012-13, and 2014-15.

FIGURE 1.8: Working Hours, Primary and Second Jobs, 2011-15, Percent



Source: NPS 2010-11, 2012-13 and 2014-15.

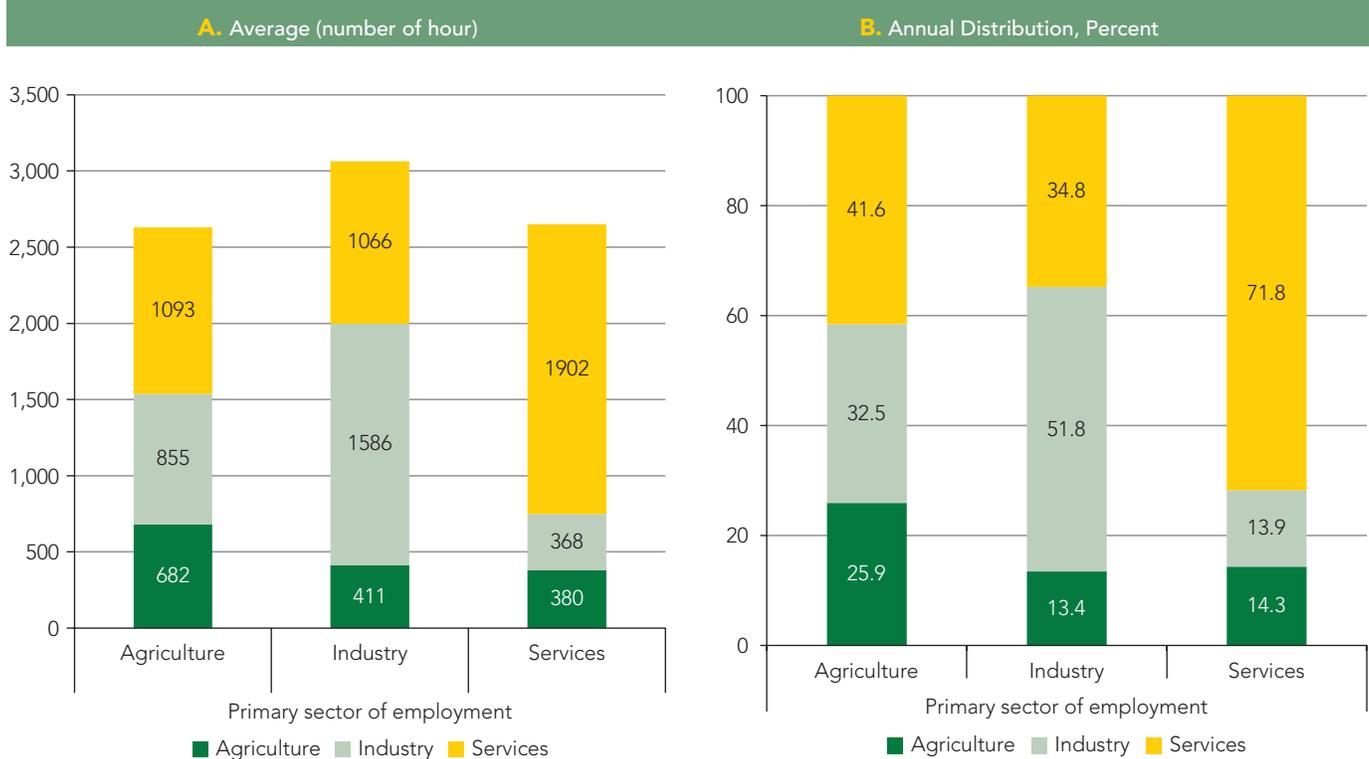
Even when agriculture is the main sector of employment, workers supply a considerable amount of time to nonfarm sectors.

In 2015 workers categorized as agricultural spent about 26 percent of their time in agriculture, 32 percent in industry, and 42 percent in services (Figure 1.9). In contrast, workers employed primarily in industry spent about 52 percent of their time in industry, 35 percent in services, and a meagre 13 percent in agriculture. Similarly, workers employed primarily in services gave it about 72 percent of their time.

On average, workers allocate far more time to nonagricultural sectors than to agriculture. In 2015, agricultural workers worked about 650 hours annually, industrial workers 1,600, and services workers 2,400 (Figure I.10). Gollin, Lagakos and Waugh (2014) estimated that nonagricultural workers gave their sectors about 1.3 times as many hours

as agricultural workers. McCullough (2017) confirmed that average hours worked by those whose primary job is non-agricultural is higher than the hours worked by agricultural workers.⁶ She found that differences ranged from 2.3–2.5 in Malawi to 2.4–2.6 in Ethiopia and 2.1–2.2 in Tanzania. Our analysis reveals that, in 2015, nonfarm-to-agriculture annual working-hour ratios are estimated at 2.2 for industry-to-agriculture and at 2.6 for services-to-agriculture. Restricting the sample to primary jobs does not substantially affect these estimates: 2.3 for the former and 2.8 for the latter. Thus, although agriculture is the main employer, agricultural workers work far fewer hours than workers in other sectors and, in parallel, supply a considerable amount of time to nonagricultural sectors.

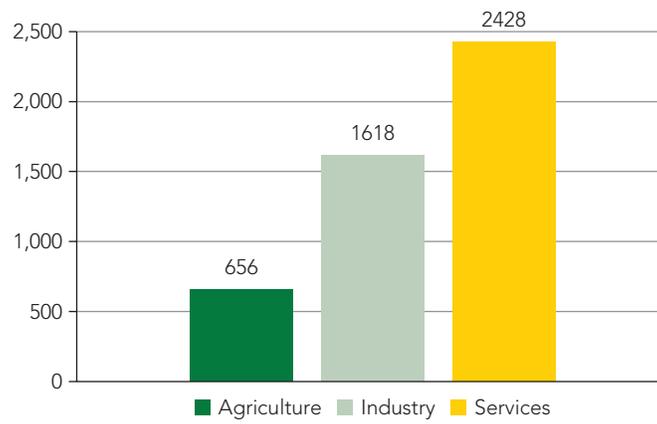
FIGURE 1.9: Annual Hours Supplied by Workers to Different Sectors, 2015



Source: NPS 2010–11, 2012–13 and 2014–15.

⁶ McCullough used micro-based productivity measures from LSMS-ISA datasets from four Sub-Saharan African countries to investigate the productivity gaps that households face, and to assess key structural change parameters—sector participation, time use, and labor productivity—from a micro perspective. Results mentioned above are for 2010–11.

FIGURE 1.10: Average Number of Hours Worked per Job Sector, 2015



Source: NPS 2010-11, 2012-13 and 2014-15.



III. Productivity Gaps

Sizable productivity gaps between agriculture and services suggest potential for enormous productivity gains from accelerating the transition of labor away from agriculture.

The enormous potential for productivity growth through structural change has not yet been realized due to the slow transition of labor. Large productivity gains could be achieved by shifting labor across sectors because the productivity gaps between sectors are significant, especially between agriculture and manufacturing or services (McMillan and Headey 2014). Given the persistent concentration of Tanzania's labor in agriculture despite the widespread poverty and underemployment among farmers, the question is why agricultural workers are not moving away faster. One possible explanation is that farmers, and rural populations generally, are confronted by barriers to entering more productive and remunerative sectors and activities—mainly too little human capital, experience, or physical or financial assets. It may also be that productivity differentials between agriculture and nonfarm sectors are not as high as the literature suggests. And even given the productivity gap, higher risks and uncertainties may offset differences in expected returns from more productive sectors. This section examines the second possibility, productivity differences between sectors using labor productivity measures from the NPS 2011 to 2015 (Box 1.1). Two measures of labor productivity, per-worker and per hour, are estimated for different types of activities in agriculture, industry, and services and the main subsectors (for details, see Appendix A).

Labor productivity is markedly higher in industry and services than in agriculture. In 2015, annual output per worker was estimated at TZS 1.9 million (about \$2,439 in Purchasing Power Parity -PPP) in industry and TZS 3.2 million (\$4,123 PPP) in services (Figure 1.11A).⁷ The estimate for agriculture is a much lower TZS 337,500 (about \$433 PPP). Thus, per-worker

productivity gaps are very wide (Figure 1.12A). Productivity is estimated to be about 5.6 times higher in industry than in agriculture, and about 9.5 times higher in services.

Adjusting productivity gaps for hours worked confirms that there are considerable differences in productivity between sectors, although narrower than those based on productivity per worker. Adjusting productivity gaps for hours worked in all sectors is expected to produce more accurate measures (Box 1.2). In 2015, productivity per hour worked in agriculture was estimated at TZS 463 (\$0.6 in PPP) compared with TZS 1,131 (\$1.40 PPP) in industry and TZS 1,494 (\$1.90 PPP) in services (Figure 1.11B).⁸ It is not surprising that these results are smaller than per-worker results due to violation of the one-sector and equal-hours-across-sector assumptions. Therefore, one hour worked in industry is estimated to be on average 2.4 times as productive as one hour worked in agriculture, and one hour worked in services is about 3.2 times as productive (Figure 1.12B).⁹

In a more granular disaggregation, commerce, mining, and transport come out to be the most productive sectors. Using productivity gaps based on participation (total output per worker), mining is the most productive industrial subsector no matter what it is compared to (Figure 1.13). On average, each mining worker produces 8 times as much as each worker in agriculture; each worker in manufacturing produces 4.8 times as much, and each worker in construction or utilities produces 5.4 times as much as an agricultural worker. Services are even more productive relative to agriculture: average productivity in commerce is about 8.6 times higher and in other services, such as transport and financial services,

⁷ Output per-worker and per-hour-worked is measured in Tanzanian shillings (TZS) and expressed in 2015 prices.

⁸ Estimates of productivity per hour worked using imputed hours indicate roughly similar productivity in agriculture whereas after imputation, productivity in industry and services declined due to a larger number of hours. Precisely, hourly productivity is estimated at TZS 890 in industry and TZS 929 in services (Appendix A).

⁹ When imputed instead of working hours are used, productivity gaps narrow from 2.4 to 2 for industry and from 3.2 to 2.1 for services (See Appendix A).

it is 10.5 times higher. When productivity is measured in terms of output per hour worked, the gaps between subsectors are smaller and less heterogenous. For example, one hour of mining is 3.1 times more productive than one hour of farming. After farming, manufacturing is the least productive—only 1.7 times more productive than agriculture. In services, one hour of work in commerce is 3 times and in other services 3.5 times more productive than one hour in agriculture.

Industry and services are more productive than farming regardless of whether the labor is supplied by nonagricultural household enterprises or wage jobs. However, the magnitude of the gap with agriculture differs (Figure 1.14). The gap between wage employment in industry and farming is estimated at 4 times and between services and farming 10 times. For both sectors, when labor is in nonfarm household enterprises, the output-per-worker gap is about 7 times.

BOX 1.1 Measuring Labor Productivity

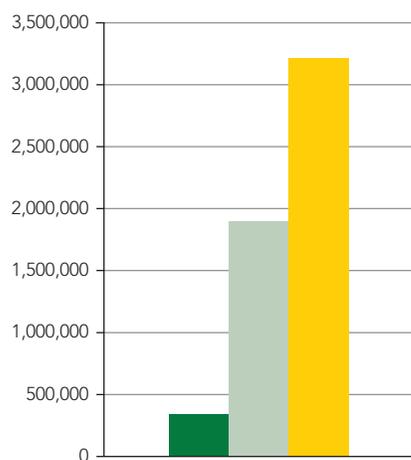
Structural transformation is a dynamic process, in terms of both reallocation of labor from less to more productive sectors, and the economic growth resulting from the move. Among factors driving the process are productivity levels within sectors and the productivity gaps between them. The wider the productivity gap between sectors, especially between agriculture and manufacturing or services, the greater the opportunity to achieve larger productivity gains as labor shifts between sectors (see Appendix A). The present analysis focuses on shifts of workers between sectors as measured by changes in the sectoral share of labor. The analysis examines the existence and extent of such labor productivity gaps from a microeconomic perspective. Estimates of productivity gaps help illuminate whether

labor is misallocated, why workers are gradually moving out of agriculture, and what is likely to be driving the modest movements of labor between sectors.

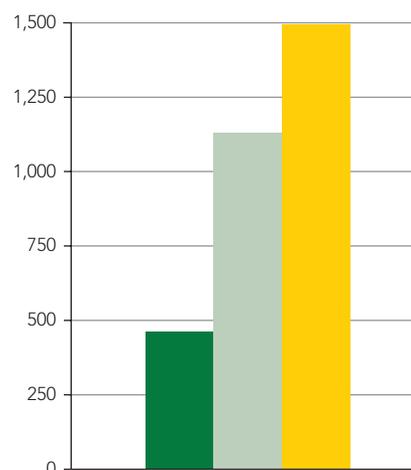
In this analysis labor productivity will be considered per worker and per hour and estimated for the three main sectors of the economy—agriculture, industry, and services—and by subsector and economic activity. Labor information will cover both primary and secondary jobs. This is very important in countries like Tanzania where a considerable share of workers have more than one job. Sectoral labor share based on household survey data will be contrasted with a common value-added measure of structural transformation based on national accounts.

FIGURE 1.11: Productivity per Worker and per Hour, by Sector, 2015 (TZS)

A. Value of Output Per Worker



B. Value of Output Per Hour Worked

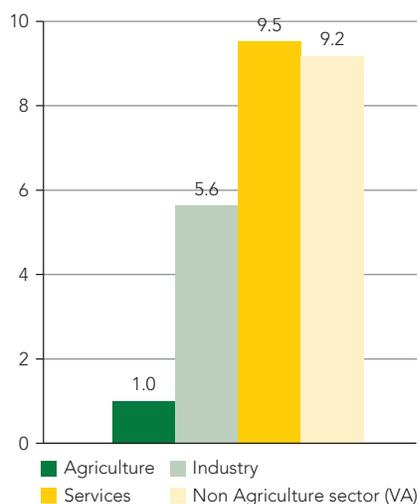


Source: NPS 2010-11, 2012-13 and 2014-15.

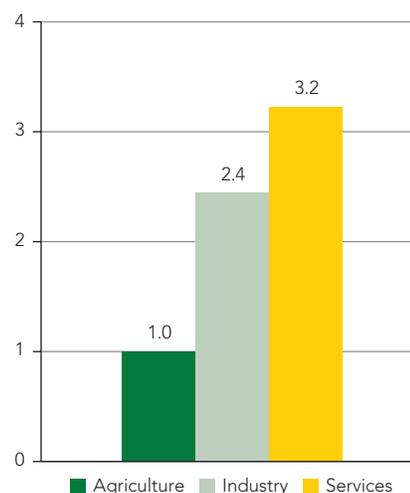
Note: Per-worker productivity gaps are calculated as ratios between productivity in industry/services and productivity in agriculture. Ratio for agriculture is therefore 1.

FIGURE 1.12: Productivity Gaps by Sector, 2015

A. Per Worker Productivity



B. Per Hour Worked Productivity



Source: NPS 2010-11, 2012-13 and 2014-15.

Note: Per-worker productivity gaps are calculated as ratios between productivity in industry/services and productivity in agriculture. Ratio for agriculture is therefore 1.

BOX 1.2 Biases of Productivity Measures in Tanzania

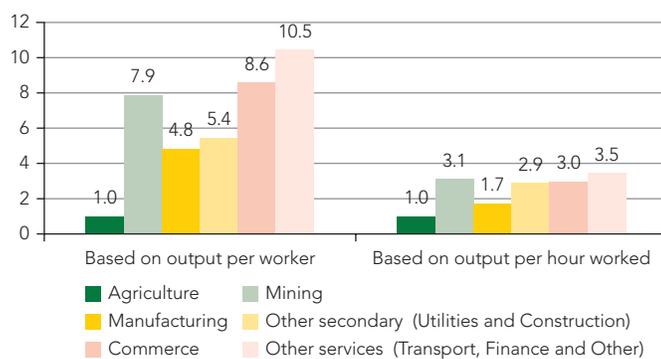
Labor productivity measures based on the primary sector of employment assume that workers do not supply labor to other sectors, and all systematically work the same number of hours whatever their primary sector may be. It is therefore important to characterize patterns of labor supply in terms of annual working hours.

For instance, if more labor is supplied to nonagricultural sectors by agricultural workers than is supplied to agriculture by nonagricultural workers, using per-worker productivity measures based only on a worker's primary activity may be biased. They are likely to overestimate the amount labor supplied to agriculture, and underestimate productivity in agriculture relative to other sectors. This is in fact true for Tanzania. Using data from the NPS, our analysis clearly rejects the cross-sector equal-hours assumption. We find that on average, workers in nonagricultural sectors put in considerably more hours than agricultural workers.

This evidence is a warning against adopting either the one-sector or the cross-sector equal-hours assumption because the microdata rejects both. Hours spent in

agriculture and hours spent in industry and services differ substantially. Furthermore, some workers have jobs in more than one sector, especially agricultural workers, who provide a considerable amount of labor to other sectors. For Tanzania, then, productivity measures based on the primary job are biased and likely to overestimate sectoral differences. Figure 1.7 makes clear the magnitude of the bias by drawing in parallel the sectoral distribution based on annual hours supplied by workers to primary and secondary jobs and the sectoral distribution based on participation in primary jobs. In all NPS rounds, the results of the two measures differ, with agriculture's labor share being lower in both rounds. Thus, agricultural productivity might be underestimated relative to other sectors when participation-based measures are used. In contrast, using hours-based measures are likely to provide higher estimates of agricultural productivity and in turn smaller productivity gaps. This is extremely important for understanding structural change at the macro level on one hand and push and pull factors that affect household and individual decisions about where to allocate their labor on the other.

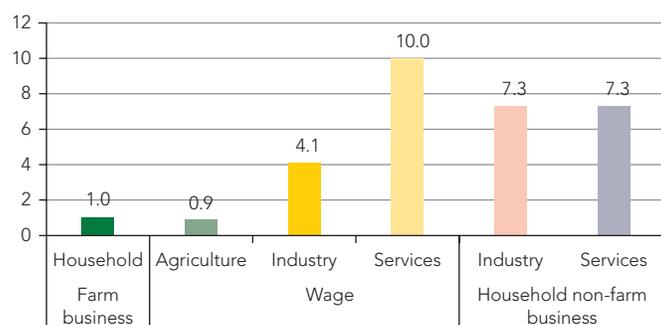
FIGURE 1.13: Productivity Gaps by Economic Sector, 2015, Percent



Source: NPS 2010-11, 2012-13 and 2014-15.

Note: The sector of reference is agriculture (ratio = 1).

FIGURE 1.14: Productivity Gaps per Worker by Activity, 2015



Source: NPS 2010-11, 2012-13 and 2014-15.

Note: The activity of reference is household farming (ratio = 1). In the case of both household and nonfarm businesses, hired labor is added to the labor provided by household members.



IV. Occupation Decision

Based on the 2014 ILFS, the industrial sector has the highest median wages and median productivity – defined as income per hour worked - of all three sectors in the economy. Median incomes in the industrial sector are around 173,000 TZS per month, which is slightly higher than what is found in services (see Appendix A for the methodology and results). Incomes in the industrial sector also appear to vary less than in other sectors. The lowest incomes are found in the agricultural sector where the mean monthly income is just under 67,000 TZS (Table A.3 in Appendix A). This is a quarter of the mean income in the industrial sector and a fifth of the mean income in the service sector. Productivity is also the lowest in the agricultural sector. On average, individuals working in agriculture make only 510 TZS per hour worked while individuals working in services make nearly three times as much on average (Table A.4 in Appendix A).

Individuals choosing to work in the industrial sector are more likely to have higher education levels than individuals in the agricultural and services sectors. This may indicate that access to higher and more stable wages in the sector are dependent on technical skills and knowledge gained through continued education. In fact, a difference in means test of educational attainment on sector indicates that individuals working in industry are significantly more likely to have completed secondary and tertiary education than all other individuals. This points to the lack of education being an important barrier to entering the industrial sector (Tables A.5 and A.6 in Appendix A).

Age has a statistically significant, but minor effect on an individual's probability of working in any sector. While the average age of individuals working in agriculture is slightly lower than the average age of individuals working in the industrial and service sectors, it does not appear that older individuals are more likely to choose employment in those sectors. In fact, the negative coefficient produced in the estimation model indicates that older individuals are less likely to opt into employment in industry and services.

Being female is associated with a slightly higher likelihood of choosing to work in the services sector than agricultural. Around 11 percent of women are employed in wholesale and retail jobs and another 6 percent are engaged in employment related to accommodation and food. However, these services sector jobs are highly gendered.

Over 90 percent of employees in transportation and storage are men while 82 percent of workers in accommodation and food are women. Thus, gender norms which dictate the proper social role for women may cause barriers for women entering into higher-productivity jobs.

As expected, individuals in rural areas are less likely to access jobs in the industrial and services sectors compared to urban ones. Only twenty five percent of employees in industry and 18 percent of those in services lived in rural areas. Furthermore, the industrial and services jobs available in the rural areas tend to be much lower paying than in urban areas. Difference in means tests of total monthly income by locality across the two sectors show that monthly mean incomes in the industrial and in the services sectors are, respectively, around 90,000 TZS and 113,000 TZS lower in rural areas than in urban areas.

Individuals choosing to work in agriculture appear to have less access to credit than individuals working in other sectors. Only 1 percent of individuals working in agriculture obtained credit over the 12 months preceding the survey period compared to 3 percent in industry and 6 percent in services, which in itself is quite low. The dominant sources of credit are savings cooperatives, banks, and financial institutions. However, use of these services appears to be extremely low among agricultural workers. This may be due to problems of proximity (i.e., banks are far away from where the farmers live), but it may also point to the existence of other institutional barriers which prevent farmers from accessing formal lines of credit. It may also be telling that several individuals operating in the private non-agricultural sector were able to access credit through relatives and private money lenders. Thus, there may be a self-reinforcing relationship between access to credit and household or family wealth.

There is evidence that lower household dependency ratios are associated with higher likelihoods of choosing employment in the industrial and services sectors. High dependency ratios are typical of rural and poor households who are predominantly employed in agriculture. Thus, this result is not surprising. Large number of dependents places a larger strain on those individuals who are in the labor force and may prevent risk taking and investing in transitioning to higher-productivity sectors.



CHAPTER 2

Firm Profiles and Structural Transformation



I. Profile of Tanzanian Firms

Tanzania's industrial landscape is primarily occupied by micro and small-scale businesses.

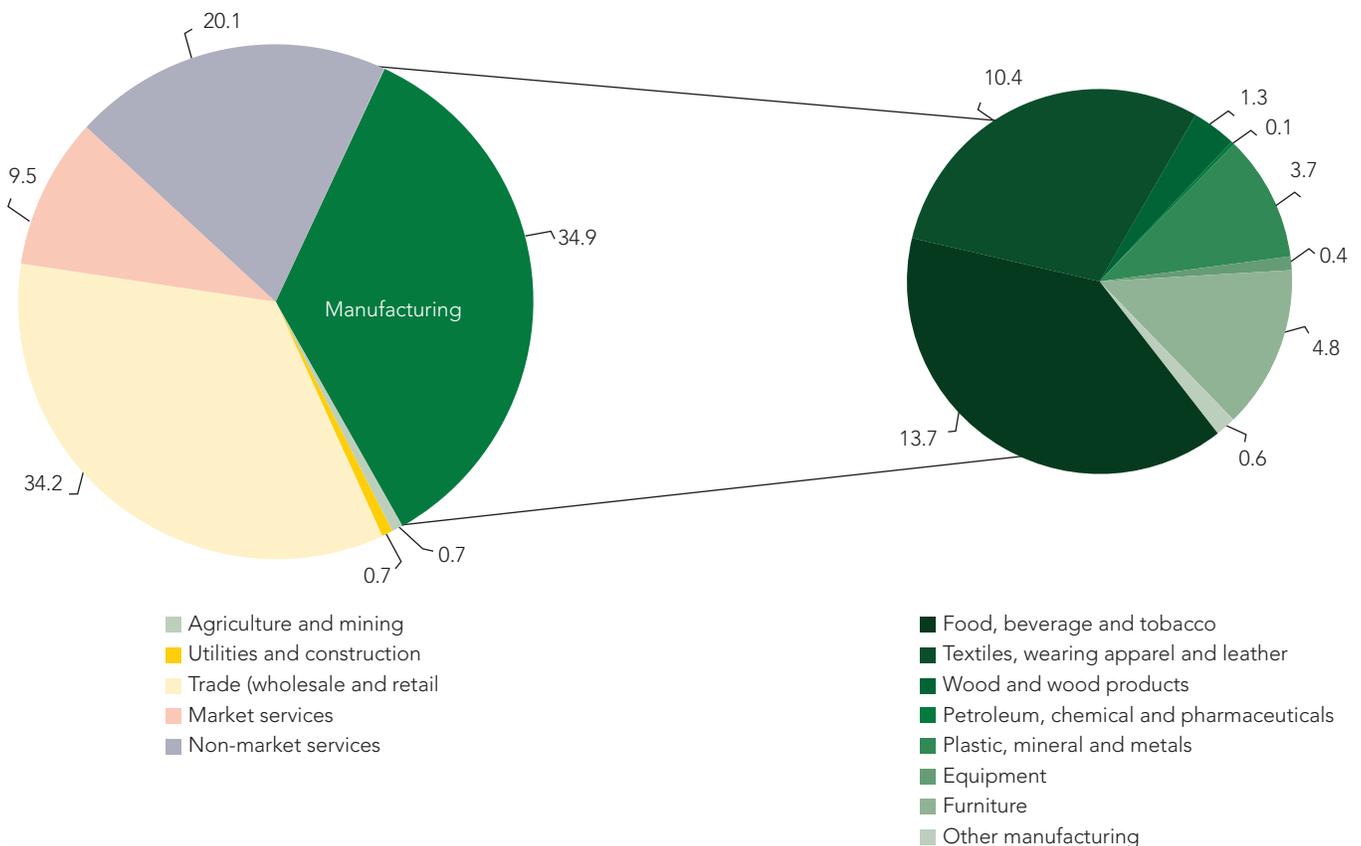
Two-thirds of businesses in Tanzania are in manufacturing or trade. The rest are essentially in services, mainly non-market (Figure 2.1A). Less than 1 percent of firms are in agriculture, as owners usually operate farms without establishing an enterprise. The number of businesses in mining and quarrying is very small, about 550. Manufacturing firms are primarily in food and beverage processing (39 percent); textiles, wearing apparel, and leather

(30 percent, mostly in apparel); and furniture (14 percent).¹ Very few firms are in high-value-added and knowledge-intensive industries. Only 1 percent manufacture computers, machinery, or electrical and transport equipment.

Micro- or small-scale enterprises account for almost all businesses. Of the 154,618 businesses, 96 percent have fewer than 10 workers, and about 60 percent of these have only

FIGURE 2.1: Firm Distribution by Sector and Size, Percent

A. Distribution by Sector of Activity



¹ Fig. 2.1C covers manufacturing firms, 2.1B all businesses.

FIGURE 2.1B. Distribution by Sector and Size Manufacturing

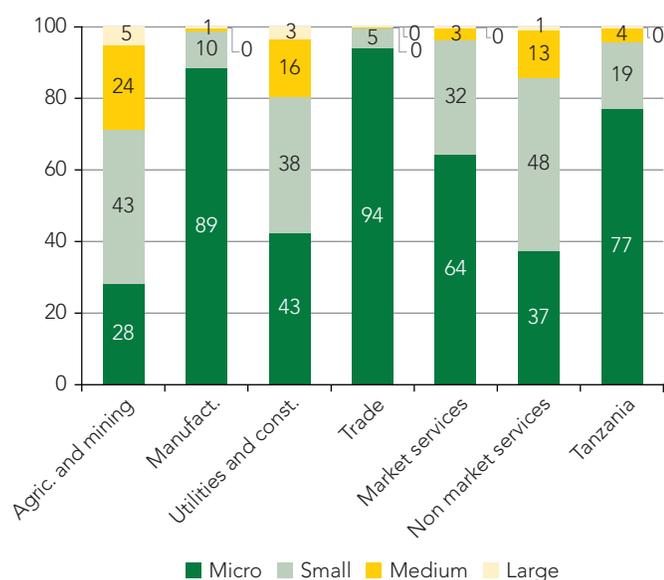
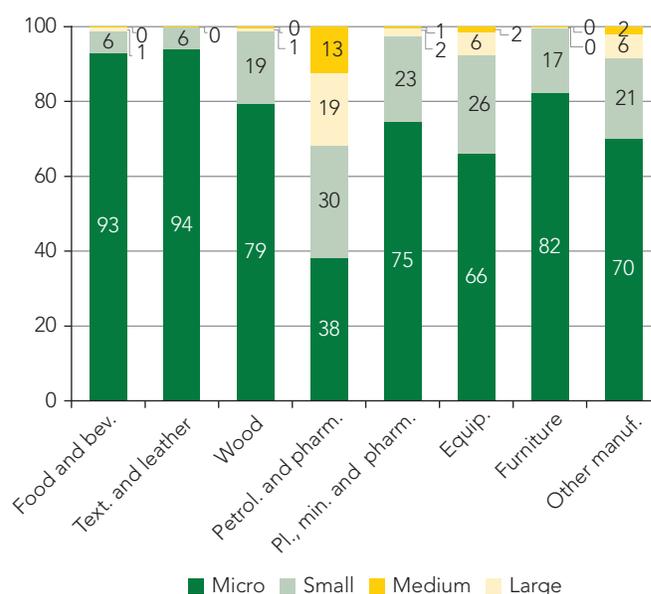


FIGURE 2.1C. Firm Distribution by Subsector and Size



Source: Tanzania Statistical Business Register (SBR) 2014/15.

Notes:

- The SBR covers 154,618 establishments operating in all sectors (NBS 2016).
- *Market services* include transportation, accommodation & food, information & communication, etc.
- *Non-market services* include scientific & technical activities, health, and education & social work activities, and public administration.
- *Equipment* includes manufacturing of computer, electrical, machinery, and transport equipment.
- Sectors and subsectors are grouped based on ISIC Rev.4 code.
- *Micro* firms employ 1-4 workers, *small* firms: 5-19, *medium* firms: 20-99, *large* firms: 100+.

one or two workers; only 1 percent of firms have more than 50 workers (Figure 2.1B). Large businesses account for 0.5 percent of all firms but are 13 percent of chemical (mainly soap and detergents) and pharmaceutical manufacturing. Large firms tend to operate in food processing, even though micro-scale firms dominate the sector.²

Most Tanzanian firms are privately owned: Although 13 percent are state-owned, 78 percent have sole proprietors and the rest are owned by other companies, religious institutions, cooperatives, and NGOs. Less than 1 percent are publicly traded. Over 80 percent of the businesses are owned by Tanzanians and a clear majority have no branches. Of privately-owned businesses, 90 percent are micro sized and operate in manufacturing and trade. State-owned companies average 15 employees, and many have more; they are concentrated in social services (education and health) and administration.

Informality is prevalent. Nearly half of Tanzanian firms (48.5 percent) are not registered by any government. The prevalence of informality varies by sector and firm size. It is

highest in manufacturing, where about 61 percent of firms are not registered; informality is predominant in textile, apparel, and leather (82 percent); furniture (76 percent); plastics, minerals, and metal (62 percent); computer and machinery (55 percent); and wood processing (50 percent). In trade and market services, about half the firms are not registered, but in nonmarket services only 14 percent are not. Informality is negatively correlated with firm size. While 56 percent of micro firms are not registered, about 95 percent of medium and large firms are (Figure 2.2D).

Tanzanian firms are young, with an average age of 8.5 years and a median age of 4; half of the firms have been in existence less than 5 years. The proportion of young firms decreases as firm size increases (Figure II.2A). Thus, most micro enterprises are young and most large enterprises older. About 22 percent of firms have been in operation for less than a year, over 90 percent are micro enterprises, and most are not registered, which suggests that very small-scale informal activities are common. Within sectors, trade and then manufacturing have the largest shares of very young firms; nonmarket services have the

² About half the large enterprises process foods and beverages, but there are only 90 of these; meanwhile 20,000 micro-firms operate in the sector.

FIGURE 2.2: Firm Distribution by Age, Size, Sector, and Informality, Percent.



Source: SBR 2014/15.

largest share of older firms, indicating that state-owned enterprises and firms operating in public sectors have higher chances of survival and growth than private ones (Figure II.2B). Over half of new entrants (57 percent) are in wholesale and retail trade, 22 percent in manufacturing, and 10 percent in market services. Informality is also pervasive among young firms (Figure 2.2C). Most businesses have little startup capital; fewer than 10 percent had initial capital investment of TZS 50 million or more. The clear majority of capital investment, particularly among micro and young firms, is from personal income. Only 20 percent of businesses secured funding from banks or microfinance institutions, with micro firms relying more on Credit Co-Operative Society (SACCOS) (3.3 percent) and other microfinance institutions (2.6 percent); larger firms rely more on bank financing (about 25 percent). The predominance of micro, young, and informal firms demonstrates how hard

it is for firms that start out self-capitalized in micro-scale activities to survive and grow, and to contribute to societal welfare and economic prosperity.



Employment is disproportionately concentrated in older and larger firms and is acutely biased against women.

Despite the predominance of micro firms in the economy, they account for just 24 percent of employment, and large firms, which represent less than 1 percent of total firms, account for 28 percent. About half of Tanzanian jobs (49 percent) are in medium and large firms, which account for about 4 percent of all businesses. Thus, the very few large firms employ on average quite a large number of workers. Even though fewer than 0.5 percent of all firms employ more than 100 workers, they account for about 28 percent of all employment—the average number of their workers is over 370, compared to no more than 2 in micro firms and 9 in small ones (Figure 2.3A). New firms in business for less than 5 years account for less than 25 percent of jobs, compared to 36 percent in firms in business for more than 20 years (Figure 2.3B). Formal firms, despite their low share in the economy, account for over 80 percent of jobs (Figure 2.3C). Overall, firms tend to employ twice as many men as women, with the gender discrepancy

slightly higher in small and young firms. In these firms, the average number of men is two times higher than that of women, while it is 1.6 times higher in larger and older firms.

Employment is skewed to nonmarket services and manufacturing, followed by trade. Farm employment is not reflected in these data because so few businesses operate in agriculture. Nonmarket services, where most public enterprises, which are larger and older, operate, account for about 46 percent of total jobs (Figure 2.3D). Manufacturing and trade follow, because more firms operate in these sectors. Mining and construction contribute less than 2 percent to total employment, but they tend to average a higher number of workers per firm than in the other sectors. These sectors, and to a lesser extent manufacturing, principally employ men, who constitute more than 75 percent of their workers. Only market services tend to have slightly more women than men.

Industrial firms employ more unskilled workers.

Over 40 percent of industrial workers are unskilled or unpaid. The 2013 Census of Industrial Production (CIP) shows the distribution of industrial firms to be similar in

terms of size, employment, age, and structure of ownership to the distribution for all businesses in the 2014/15 Tanzania Statistical Business Register (SBR). The CIP provides more

FIGURE 2.3: Employment by Gender and Firms Characteristics

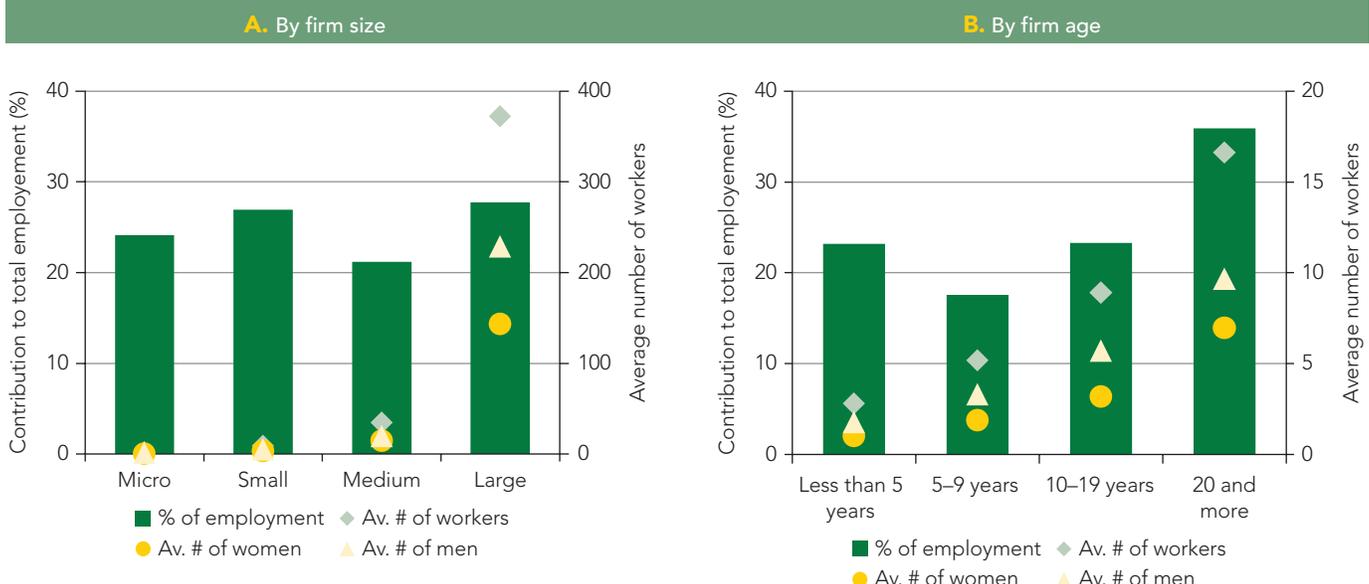


FIGURE 2.3C. By informality status

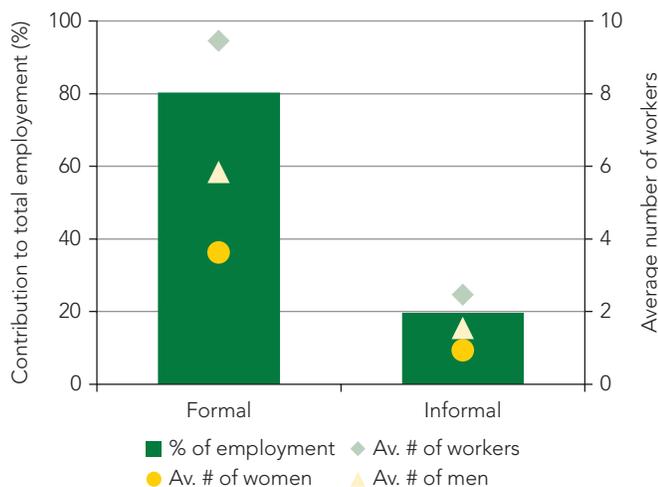
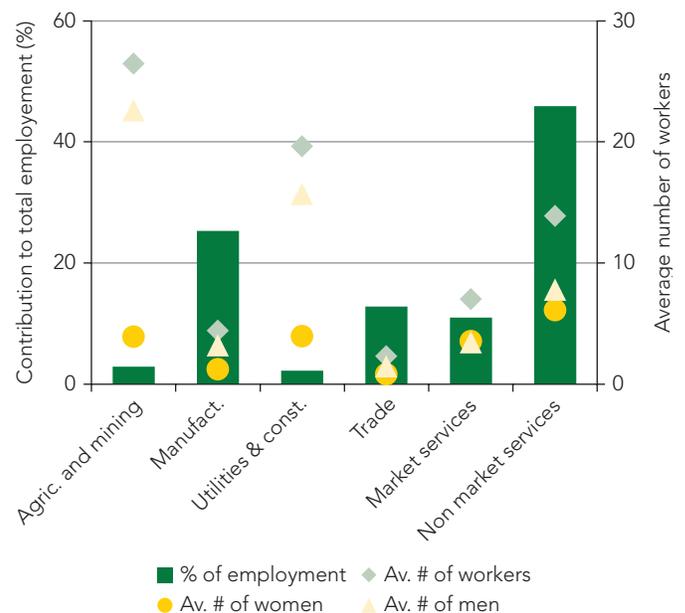


FIGURE 2.3D. By firm sector



Source: SBR 2014/15.

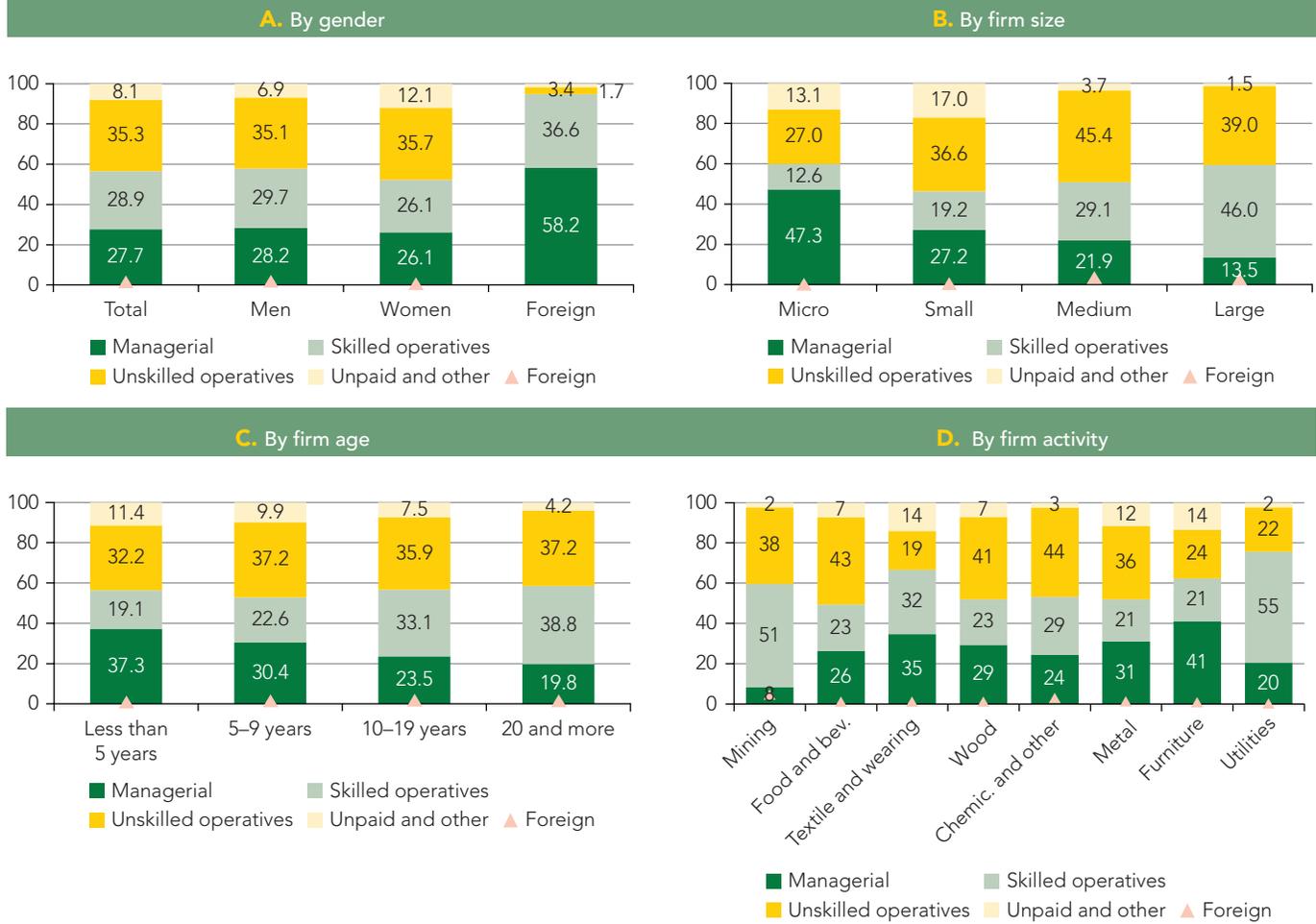
details on workers and industrial establishments. It shows that about 28 percent of the workers are working proprietors, managers, or professionals and 29 percent are skilled (Figure 2.4A). The rest are essentially unskilled or unpaid workers. About 77 percent are men, who constitute a slightly larger proportion of managerial and skilled professionals than women. Only 1.5 percent of workers are non-Tanzanian, and most of them are in professional and skilled positions, which suggests their employment is a way to compensate for the skills deficit.

Large and older firms tend to rely more on skilled labor than small and younger ones. The share of managerial and professional positions may seem to be significantly higher in micro and very young firms (Figures 2.4A and 2.4B), but that is because self-employment predominates in these firms. About a third of these are one-person firms where the worker is the proprietor (i.e., self-employed). Although medium and larger firms, which are also older, have significantly more skilled workers than smaller and younger ones, more than 40 percent of their workers are unskilled. These firms tend also to hire more skilled males, often foreigners.

Manufacturers of foods and beverages, followed by those in wood processing, account for the largest shares of unskilled labor. The sectors dominating industrial production are food and beverage processing, 40 percent of firms, and manufacture of textiles and wearing apparel, 29 percent. The vast majority of these firms are young and micro-sized.³ Nearly 50 percent of those making textiles and wearing apparel and 28 percent of those in food and beverage processing are one-person firms, and about 50 percent of workers in the latter are unskilled or unpaid. This proportion holds even for medium and large firms in the sector. The lower share of unskilled workers in textiles and wearing apparel is due to the predominance of self-employment. However, in the few firms—less than 1 percent—that have managed to survive and grow in this sector, skilled workers now account for about 65 percent of the workers. The situation is similar among furniture manufacturers. About 14 percent of firms operate in this industry, of which about one-fourth are self-employed sole proprietors. Skilled workers account for over 50 percent of those employed by the very few firms (0.4 percent) that have managed to become medium and large in this industry, compared to less than 20 percent employed by smaller firms. About 8 percent of workers are in metal manufacturing and

³ About 42 percent of firms in food processing and 30 percent of those in textiles and wearing apparel are one year old or less.

FIGURE 2.4: Industrial Employment by Skills, Percent



Source: Census of Industrial Production (CIP) 2013.

Note: Chemical & other includes manufacture of pharmaceutical, chemical, paper, electronic, plastic, repair of machinery etc. they are grouped together due to the very limited number of firms operating in these sectors. The predominance of unskilled employment in this sector is due to the prevalence of unskilled workers in the plastic industry and manufacture of detergents.

4 percent in wood manufacturing. Wood manufacturing firms are larger and older than those previously discussed. However, the fact that more than 50 percent of their workers are unskilled, suggests that furniture processing is still very basic. Mining and utilities, followed by manufacture of appliances and machinery, which account for significantly greater shares of large and older firms, rely more on skilled employees. Mining has more foreign workers, 4.5 percent, than the national average of 1.5 percent. However, no more than 1 percent of industrial firms operate in mining or utilities.

The shortage of qualified labor severely challenges the growth of large industries. About 13 percent of all industrial firms—and 33 percent of medium and large firms—consider it a major problem. This suggests that as firms grow, they engage in more sophisticated activities that require workers

with more skills, which are lacking in Tanzania. The lack of skills particularly affects mining, utilities, and more technically advanced industries like machinery, electric equipment, medical and pharmaceuticals, chemicals, and plastic. It also severely affects large furniture manufacturers, nearly 40 percent of whom report that the shortage of qualified labor is a major challenge.

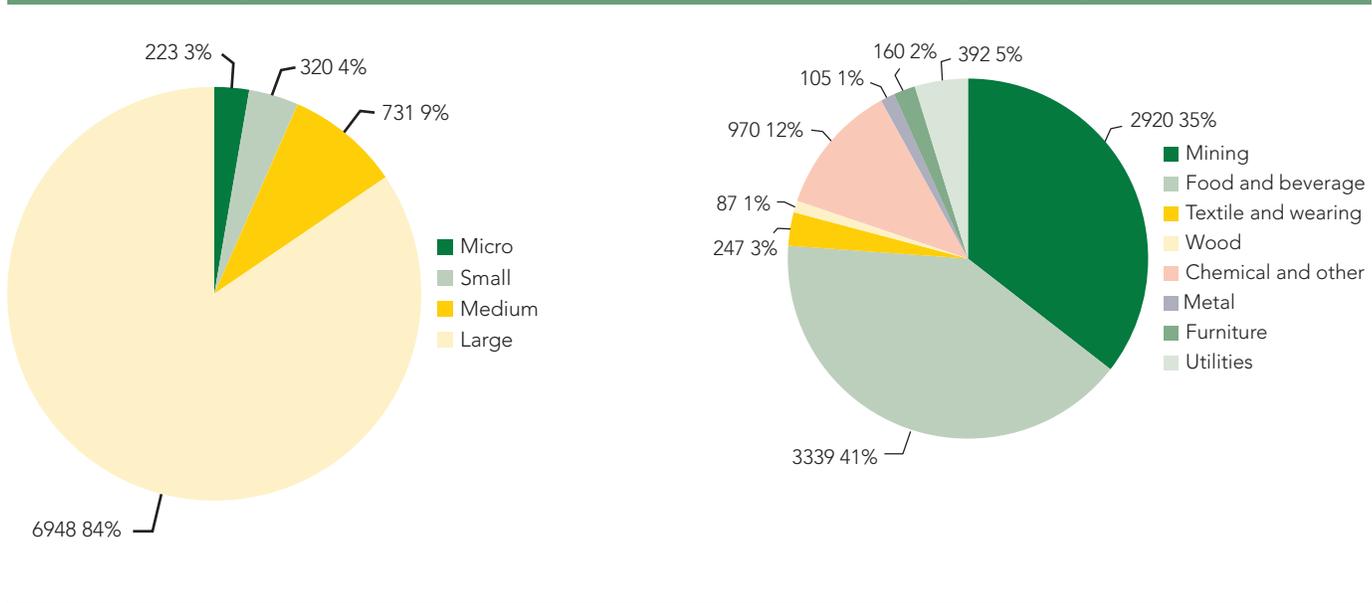


The largest share of value added in industry is generated by large firms and in sectors where there are more of these firms.

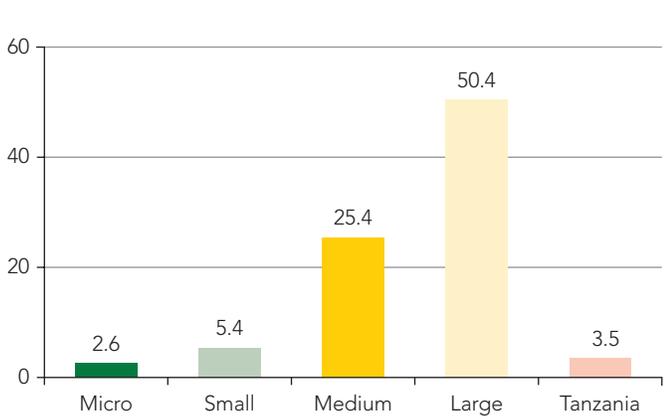
Large firms contribute the highest proportion of value-added in industry. Total value-added in industry in 2013 was TZS 8,220,560 million, 84 percent of it contributed by large firms (Figure 2.5). Value-added per worker in large firms is 2 times higher than in medium firms and about 20 times higher than in micro-firms. It appears that firms that manage to grow over time become markedly more productive. Yet, they account for only 0.5 percent of industrial firms, which may explain why industry in general is persistently unproductive.

Manufacture of food and beverages, followed by mining and carrying, contribute the most to Tanzanian value-added. Food and beverage processing is the largest manufacturing sector and value-adding subsector of the economy, at about 41 percent, due to both its large number of firms and the high value-added generated by such industries as those making sugar, malt liquor, and soft drinks, where most firms are large or medium. However, the per-worker value-added is relatively low because there are also numerous

FIGURE 2.5: Value Added by Firm Characteristics



C. Per worker by size (million TZS)



Source: CIP 2013.

D. Per worker by activity (million TZS)

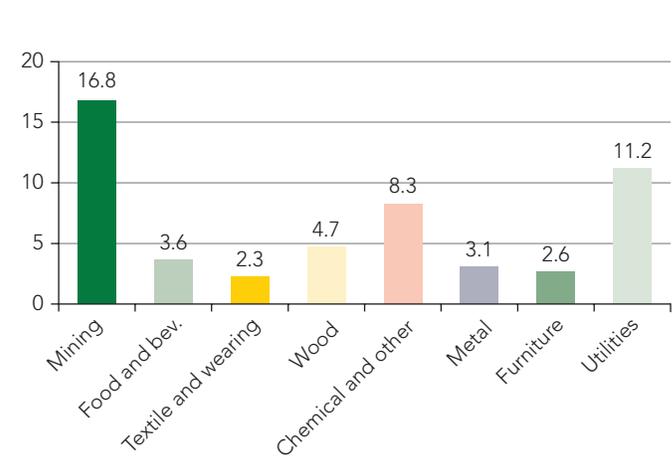
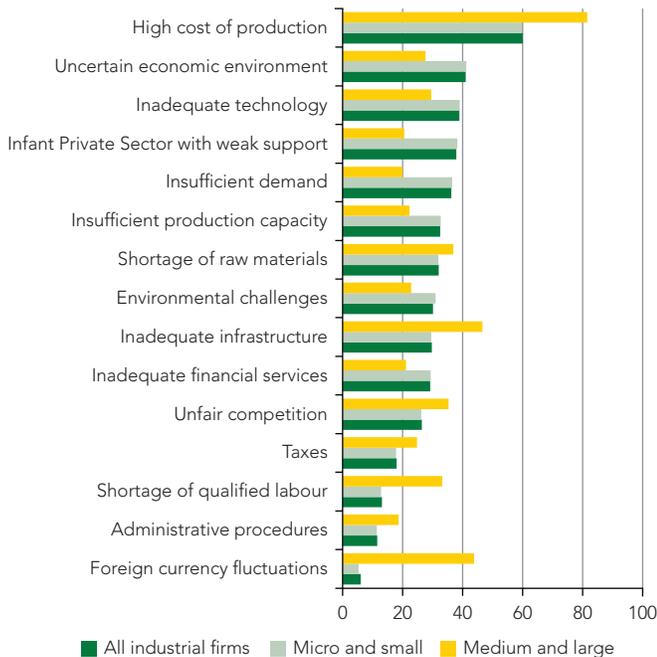


FIGURE 2.6: Major Challenges Faced by Industrial Firms, Percent



Source: CIP 2013.

micro-firms. In mining, where 40 percent of the firms are medium or large, total and per-worker value-added are very high. Value-added is also quite high in manufacture of electronic components, nonmetallic minerals, and plastic products, but there are few firms in these areas. Although manufacturers of wood and metals contribute very little to total value-added, their value-added per worker is relatively important.

Small firms are more hemmed in by the surrounding economic environment and lack of support for entrepreneurs, large firms by factors related to competitiveness. The high cost of production is perceived as the leading block to better



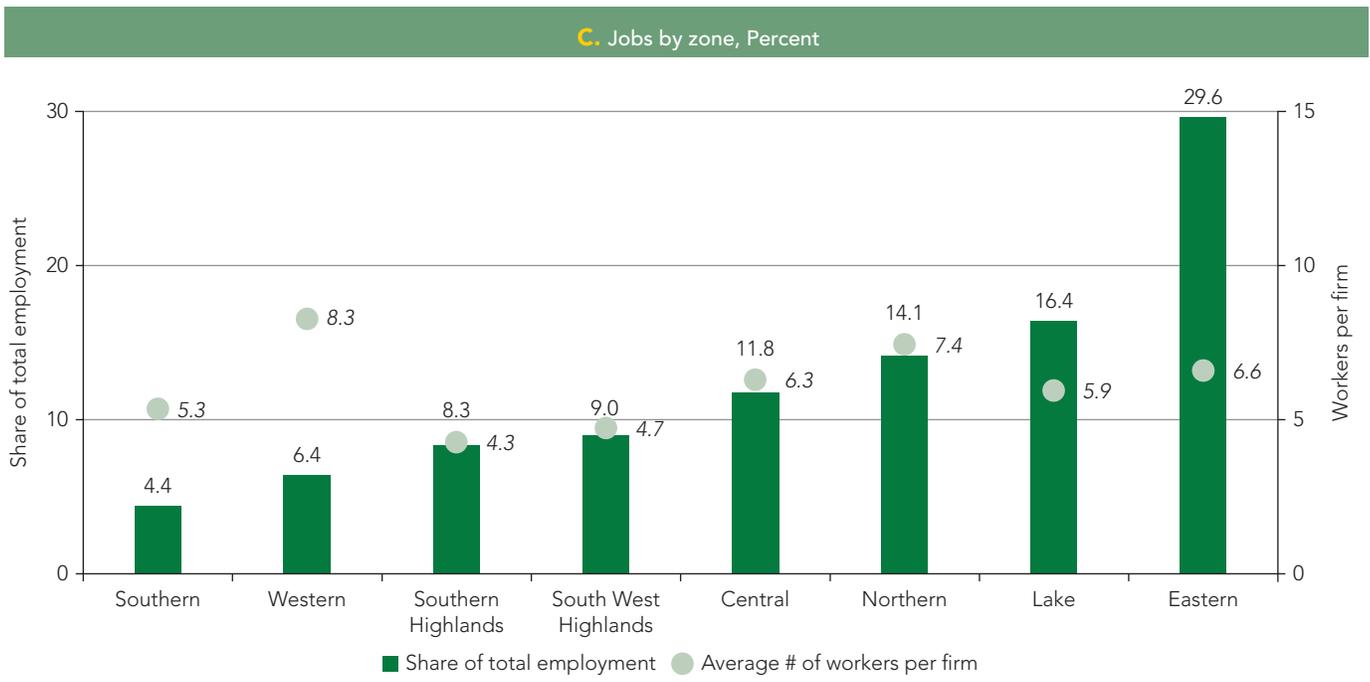
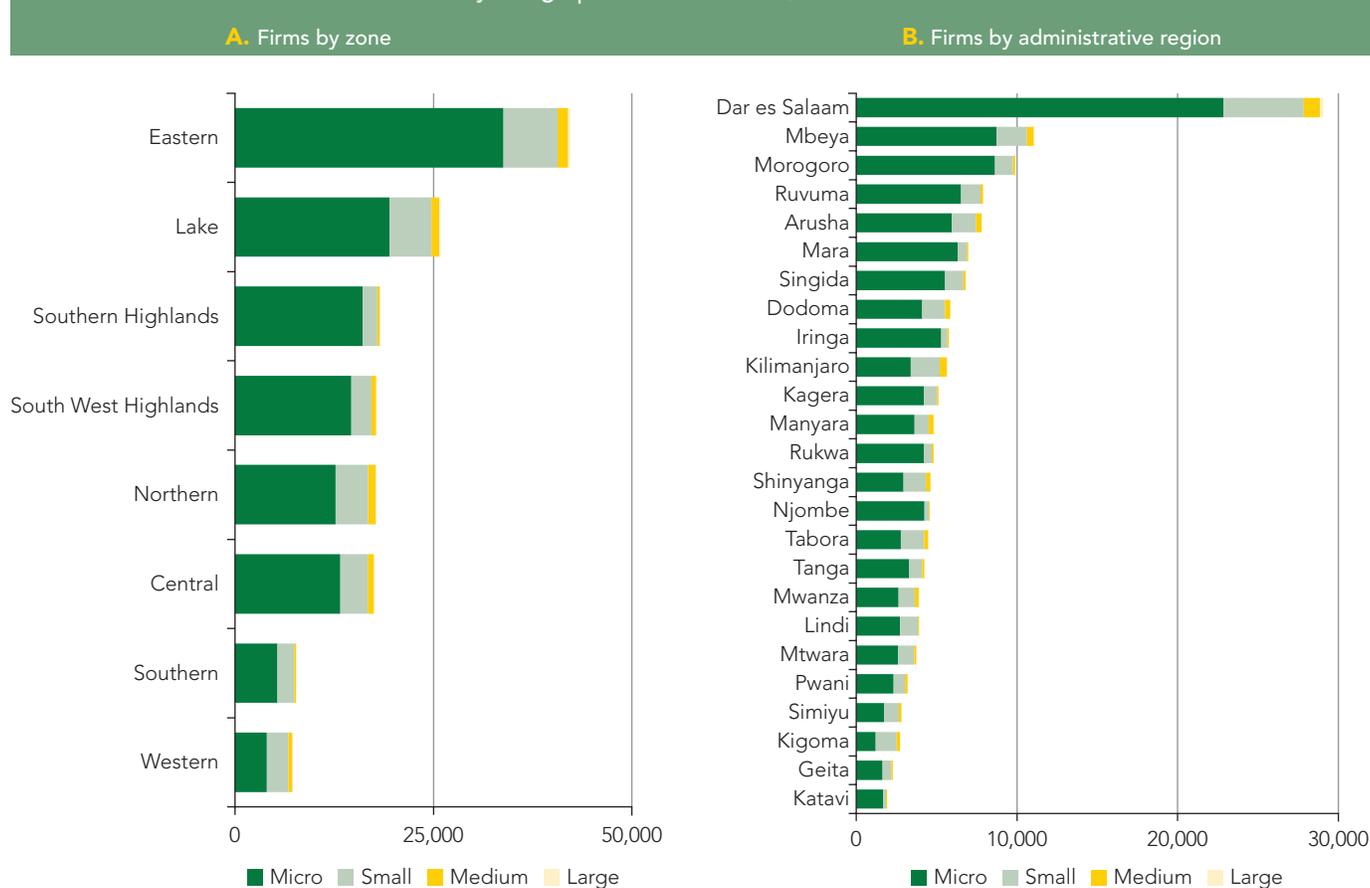
performance by both small and large firms. However, small and large firms differ in their perception of the importance of other problems. More than 30 percent of micro- and small firms cite the uncertain economic environment, inadequate technology, lack of support to the private sector, and insufficient demand and production capacity as their major concern (Figure 2.6). However, more than 30 percent of medium and large enterprises report inadequate physical infrastructure, currency fluctuations, unfair competition, and lack of raw materials and qualified labor as the main blocks. Inadequate financial services also rank high as a challenge to industry, but the problem affects small firms more than larger ones.

The distribution of firms and employment across Tanzania is uneven, resonating with the distribution of poverty.

Disparity in the geographical distribution of firms is pronounced. Businesses are concentrated in the Eastern zone, with 27.3 percent, and the Lake zone, with 16.7 percent. In contrast, 5 percent or fewer businesses are in the Southern and Western zones (Figure 2.7A). Disparity in the regional

distribution of businesses is even more pronounced; at nearly 20 percent Dar es Salaam has by far the highest number of firms (Figure 2.7B). Arusha, Mbeya, Morogoro, and Ruvuma house 5–7 percent each, while less than 2 percent are located in Geita, Katavi, Kigoma, and Simiyu, and there are relatively

FIGURE 2.7: Firm and Job Distribution by Geographic Characteristics, Percent



Source: SBR 2014/15.

Note: Tanzania Mainland is divided into eight zones based on DHS 2015/16 classification: (1) **Western:** Tabora, Kigoma; (2) **Northern:** Kilimanjaro, Tanga, Arusha; (3) **Central:** Dodoma, Singida, Manyara; (4) **Southern Highlands:** Iringa, Njombe, Ruvuma; (5) **Southern:** Lindi, Mtwara; (6) **South West Highlands:** Mbeya, Rukwa, Katavi; (7) **Lake:** Kagera, Mwanza, Geita, Mara, Simiyu, Shinyanga; and (8) **Eastern:** Dar es Salaam, Pwani, Morogoro.

few in Lindi, Mtwara, or Pwani despite their favorable coastal location. It is important to note that there are large disparities in the distribution of businesses across the administrative regions within the Lake zone: most businesses are in Mara, while Geita and Simiyu have the fewest number of firms.⁴ The distribution of manufacturing firms by both geographic zones and regions is very similar to the pattern for all businesses.

Micro-and small-scale businesses predominate in all regions, but some regions have larger proportions of medium and large businesses. The Eastern zone, because Dar es Salaam is there, has 25 percent of medium and 39 percent of large businesses, including most manufacturing firms.⁵ In the Central zone, particularly in Manyara, and the Northern zone, in Arusha and Kilimanjaro, over 5 percent of all businesses are medium and large and are manufacturing firms.⁶ Southern Highlands and South West Highlands are third in terms of where Tanzanian businesses are concentrated, but they have the largest shares of micro-sized (90 percent) and informal businesses (60 percent). As for informality, about 55 percent of firms in Dar es Salaam are not registered.

As a result of the uneven distribution of businesses, jobs are concentrated in the Eastern and Lake zones, where most firms are located. Because of Dar es Salaam, the Eastern zone accounts for 30 percent of all jobs (Figure 2.7C), followed by the Lake zone with 16 percent and the Northern

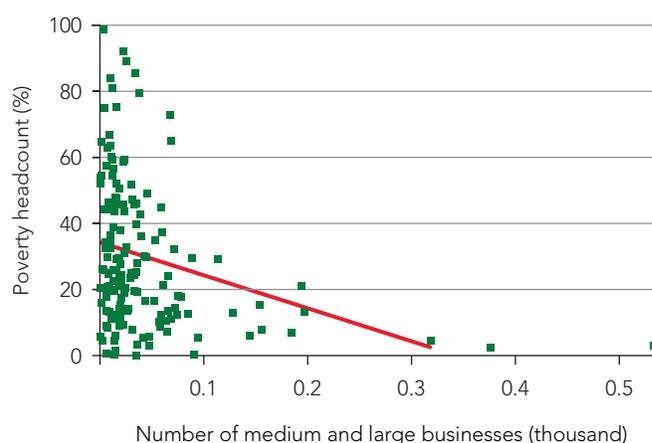
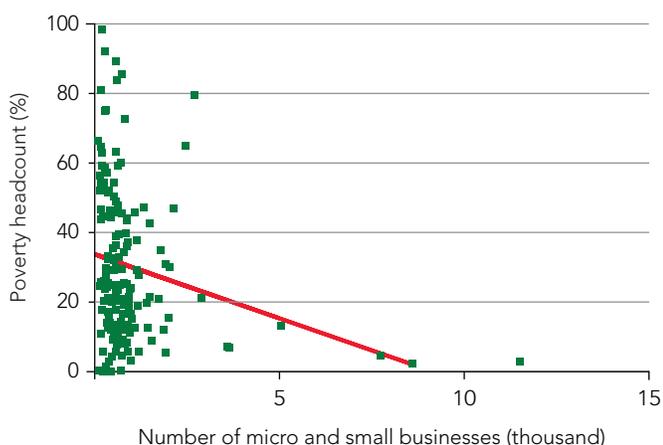
zone with 14 percent. The Western and Southern zones are both home to no more than 6 percent of jobs. Yet firms in the Western zone have the highest average number of workers (8.3), ahead of firms in the Northern (7.4), Eastern (6.6), and Lake (5.9) zones. The highlands zones have the fewest workers per firm, because the businesses operating there are very small. Regionally, Dar es Salaam accounts for 21.2 percent of all jobs, trailed far behind by Mbeya, Kilimanjaro, and Arusha. The regions of Tabora, Dodoma, Mwanza, Manyara, and Ruvuma each have just over 4 percent of jobs. The lowest shares are in Katavi, Geita, Njombe, and Rukwa, which each account for less than 2 percent. Firms in Mwanza have the highest average number of jobs at 10.2, followed by Kilimanjaro, Kigoma, Pwani, and Ruvuma, where the average number of jobs per firm is about 9. Katavi, Njombe, Rukwa, Iringa, and Lindi have the lowest average number of jobs per firm at less than 4.

The geographic distribution of firms resonates with the spatial distribution of poverty (Figure 2.8). This indicates that the more businesses are present, whether manufacturers or other types, the more poverty is reduced in the district or region. Even though micro and small firms are known for not paying well, their presence makes a significant contribution to improving living standards and reducing poverty. Not surprisingly, however, poverty reacts more positively—drops more—to the presence of medium and large businesses.

FIGURE 2.8: Poverty and Firm Distribution by Geographic Zone

A. Poverty declines significantly with the number of micro and medium and small businesses...

B. ... and the decline is even stronger with the number of large businesses



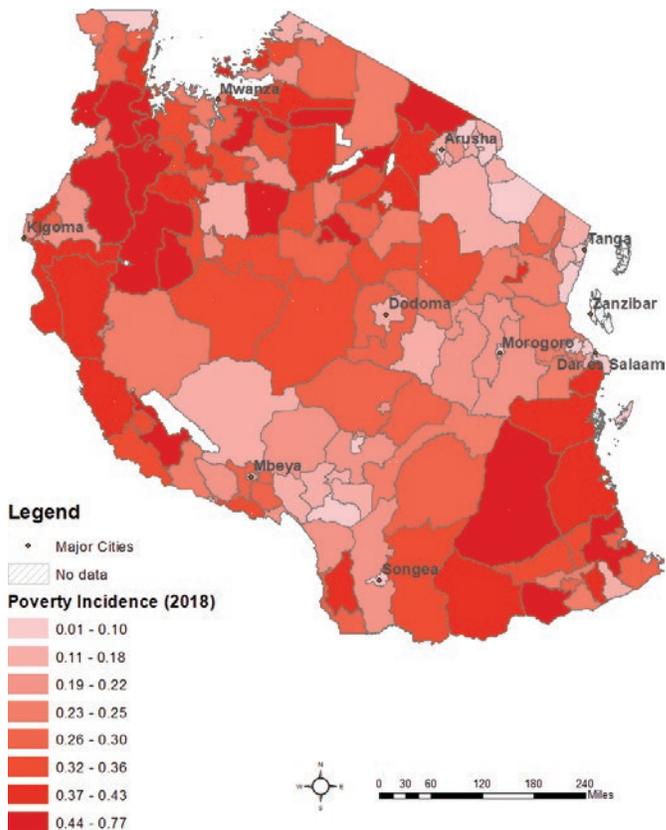
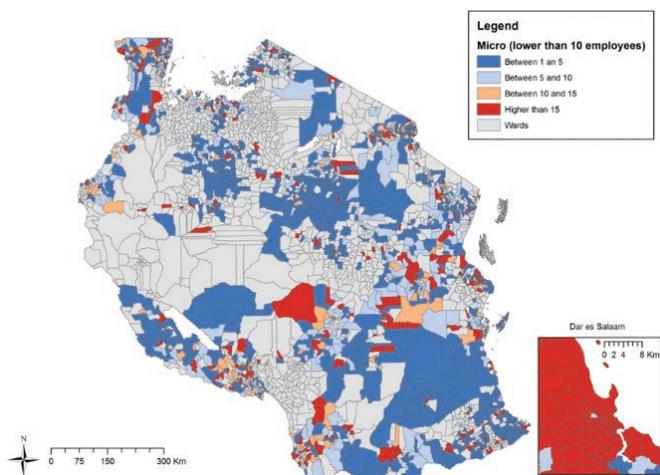
⁴ The disparity of the distribution of businesses within the Lake zone is in line with the disparity of poverty. Mara, which contains the largest number of firms, has a poverty rate of 23 percent. Geita and Simiyu, where the number of businesses is the lowest, have poverty rates at, respectively, 37 and 39 percent.

⁵ About 33.5 percent of medium and large manufacturing firms operate in Dar es Salaam. They account for nearly 4 percent of all manufacturing firms in the city.

⁶ About 7 percent of medium and large firms operate in Arusha and represent around 5 percent of all firms there. About 7 percent are in Manyara and nearly 8 percent in Kilimanjaro.

FIGURE 2.8C: Districts with higher concentration of businesses...

FIGURE 2.8CD: ... also have less poverty



Sources: SBR 2014/15, 2012 Population Census data, HBS 2018, and Tanzania Jobs Diagnostic (2017).

Notes: The number of poor has strong and significant correlations with the number of micro/small businesses, estimated at -0.04 , and of medium/large businesses, estimated at -0.98 , both significant at 1 percent, with the latter relationship being stronger ($R^2 = 0.08$, $p\text{-value} = 2 \times 10^{-5}$ compared to $R^2 = 0.05$, $p\text{-value} = 4 \times 10^{-3}$). These relationships are robust to controlling for district or region characteristics such as access to basic services, distance to main services, etc. The results are also robust to restriction of the sample to industrial firms.

These results are supported by the 2015–16 Demographic Health Survey (DHS), which found that in the Western and Southern zones, which have the fewest firms, in the former 2 in 3 people and in the latter about 5 in 10 are in the two lowest

wealth quintiles. Conversely, more than 7 in 10 people in the Eastern zone (75 percent) are in the two highest quintiles, and over 50 percent are in the richest quintile.



II. Which Firms Create the Most Jobs

The objective of this section is to establish the profile by activity, size, and age of firms that created the most jobs between 2010 and 2013—the reference years for the 2013 Enterprise Survey. Most of Tanzania’s jobs are concentrated in large firms, but large firms are relatively rare. According to Tanzania’s 2013 Enterprise Survey, formal enterprises with more than 100 employees represent just 2

percent of all formal firms but account for 35 percent of total employment in formal firms.⁷ Conversely, small firms, those with 5–19 workers, constitute 63 percent of formal companies but account for only 32 percent of jobs, and micro-firms, those with 4 or fewer employees, constitute 17 percent of all firms but account for just 2 percent of total employment (see Appendix B for more details).

Between 2010 and 2013 average productivity decreased slightly for of all firms, but firm performance is still quite good.

The slight dip in firm productivity between 2010 and 2013 had no clear relationship to firm size or age. Average firm productivity, calculated as real gross output per worker,

fell by 4.3 percent, but there is no correlation with firm size (Table 2.1). The largest firms seemed to be not the most productive, ranking third after one- and two-worker firms.

TABLE 2.1: Productivity of Firms by Size and Age, 2010 and 2013

	PRODUCTIVITY 2010 – LN(Y/L)		PRODUCTIVITY 2013 – LN(Y/L)		VARIATIONS (%)	
	MEAN	MEDIAN	MEAN	MEDIAN	MEAN	MEDIAN
By size						
1	16.3	16.5	17.8	18.1	9.3	9.8
2	16.4	16.8	16.2	16.1	-1.4	-4.1
[3–4]	16.1	16.5	14.8	15.2	-7.8	-8.1
[5–9]	16.2	16.2	15.3	15.3	-5.5	-5.9
[10–19]	15.8	15.9	15.1	15.2	-4.4	-4.4
[20–49]	15.6	15.5	15.2	15.2	-2.4	-1.9
[50–99]	15.8	16.2	15.6	16.1	-0.9	-0.3
[>=100]	16.5	17.2	16.1	16.3	-2.6	-5.5
By age (years)						
1			16.5	16.5		
2	14.7	16.9	16.3	16.2	10.7	-4.1
3	16.1	16.5	15.2	15.3	-5.6	-7.4
4	15.1	15.8	14.7	15.4	-2.7	-2.4
[5–9]	16.4	16.2	15.2	15.2	-7.1	-6.6
[10–14]	16.1	16.0	15.6	15.8	-2.9	-1.6
[15–19]	15.9	15.6	15.2	15.2	-4.2	-2.9
[>=20]	15.8	15.6	15.5	15.3	-1.7	-1.5
Total	16.0	16.0	15.3	15.3	-4.3	-4.5

Source: Enterprise Survey 2013.

Note: Y is measured as the gross output reported by the firm during the survey; L is the total of permanent full-time workers at the end of the fiscal year preceding the survey.

⁷ This section builds on data from the 2013 Enterprise Survey and uses the approach developed by Rijkers et al. (2014). See Appendix B for more details on the methodology.

TABLE 2.2: Production by Firm Size and Age, 2013, Percent

	CAPACITY UTILIZATION		AVERAGE NUMBER OF OPERATING HOURS PER WEEK	
	MEAN	MEDIAN	MEAN	MEDIAN
By size				
1	77.4	82	30.7	12
2	33.1	25	22.1	10
[3–4]	86.2	100	83.4	84
[5–9]	81.8	100	32.5	11
[10–19]	91.9	100	27.8	11
[20–49]	81.3	100	33.4	11
[50–99]	87.7	80	49.2	40
[>=100]	85.5	90	62.5	45
By age (years)				
1				
2	100.0	100	63.0	63
3	46.1	33	60.7	24
4	76.8	80	59.6	12
[5–9]	76.2	90	35.7	12
[10–14]	74.4	85	43.1	11
[15–19]	87.6	100	30.1	11
>=20	83.1	100	32.1	11
Total	80.2	100	35.3	11

Source: Enterprise Survey 2013.

The largest increases in productivity occurred for firms with a single worker (+9.3 percent). Conversely, productivity of 3-to-4-worker firms fell by 5.5 percent. Similarly, no relationship can be drawn between firm age and productivity. The

Net job creation has been primarily driven by large and older firms.

Net job creation is positively and significantly correlated with increased firm size. Small firms created 33.5 percent of new jobs, medium firms 36.6 percent, and large firms 30.5 percent (Figure 2.9 and Table 2.3).⁸ However, micro firms lost jobs; they were down by about 1 percent. Regression results of net job creation on firm size dummies suggest that job creation is the highest among firm employing 50 workers and more: the net job creation rate in these firms is about 50 percent higher than that of one-person firms (Table C.1 in Appendix C).

Excluding new entrants does not affect the pattern.

When excluding firms created between 2010 and 2013, larger firms still appear to contribute the most to net job creation.

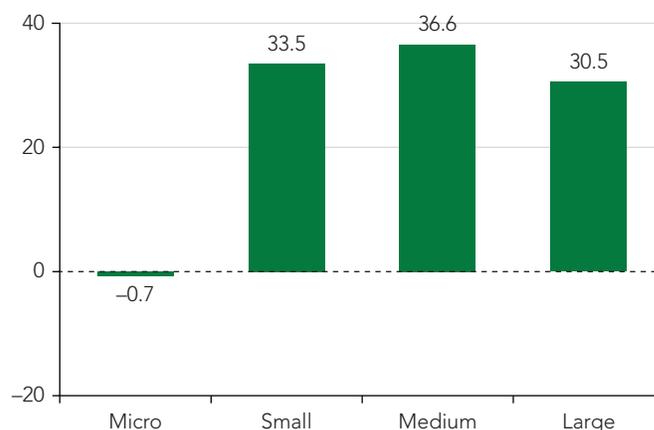
⁸ Net job creation is calculated as the difference between firm size in 2013 and in the start-up year for firms that opened in 2011, 2012, or 2013, and between firm size in 2013 and in 2010 for firms that existed before 2011. See Appendix C for more details.

youngest firms, 2 years old, performed better than the rest with productivity rising by 10.7 percent. In general, all firms, regardless of size, perform at about the same level.

On average, Tanzanian firms use 80 percent of their production capacity--the extent to which a firm can use all its potentiality for production. Capacity is related to neither firm size nor firm age. Self-employers use more than three-quarters of their capacity, firms of two workers use only a third (Table 2.2). All firms with more than three workers use on average at least 80 percent of their capacity, peaking at 92 percent for 10–19-worker firms. Due to missing data, utilization capacity was not computed for firms in business for only a year. Firms with 2 years of operation use their total production capacity but firms in business for 3 years use less than 50 percent; 4–15-year-old firms about 75 percent, and the oldest firms more than 80 percent.

Tanzanian firms operate on average 35 hours a week, and hours in operation tend to decrease as firms age. Firms of 2 workers operate just 22 hours a week (Table 2.2). This could explain why they use only a third of their capacity. Meanwhile, 3–4-worker firms, which use most of their capacity, also operate longer each week—much more than the largest firms. As the age of firms increases, their weekly operating hours tend to decrease. While the oldest firms average 30–32 hours a week, young firms tend to work overtime, operating more than 60 hours a week.

FIGURE 2.9: Share of Jobs Created by Firm Size, 2010–13, Percent



Source: Enterprise Survey 2013.

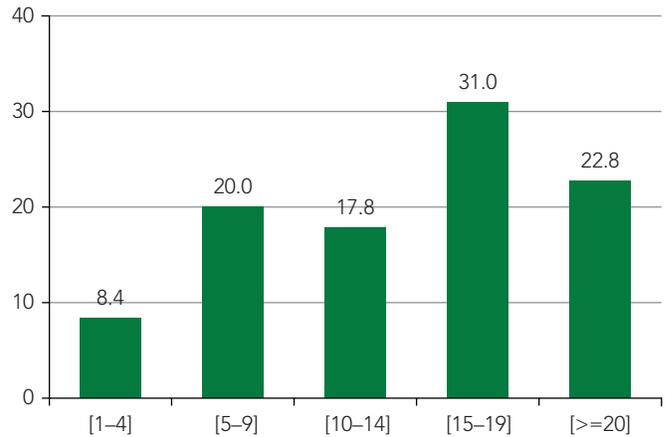
Notes: Micro firms employ 1–4 workers, small firms 5–19, medium 20–99, and large: 100 or more.

Net job creation is the difference between firm size in 2013 and 2010. Job creation without new entrants is the difference between firm size in 2013 and 2010 for firms set up before 2011. Job creation with new entrants is the difference between firm size in 2013 and at the startup year for firms set up after 2010.

TABLE 2.3: Net Job Creation by Firm Size, 2010–13

Firm size	NET JOB CREATION ALL FIRMS		NET JOB CREATION WITHOUT NEW ENTRANTS		NET JOB CREATION NEW ENTRANTS
	(#)	(%)	(#)	(%)	(#)
1	-319	-1.1	-178	-0.6	-141
2	9	0.0	9	0.0	0
[3-4]	113	0.4	27	0.1	86
[5-9]	4,253	14.2	3,829	13.1	424
[10-19]	5,821	19.4	5,539	18.9	282
[20-49]	5,253	17.5	5,178	17.7	76
[50-99]	5,745	19.1	5,745	19.6	0
[>=100]	9,178	30.5	9,178	31.3	0
Total	30,053	100	29,326	100	726

FIGURE 2.10: Jobs Created by Age Class, 2010–13, Percent of Firms



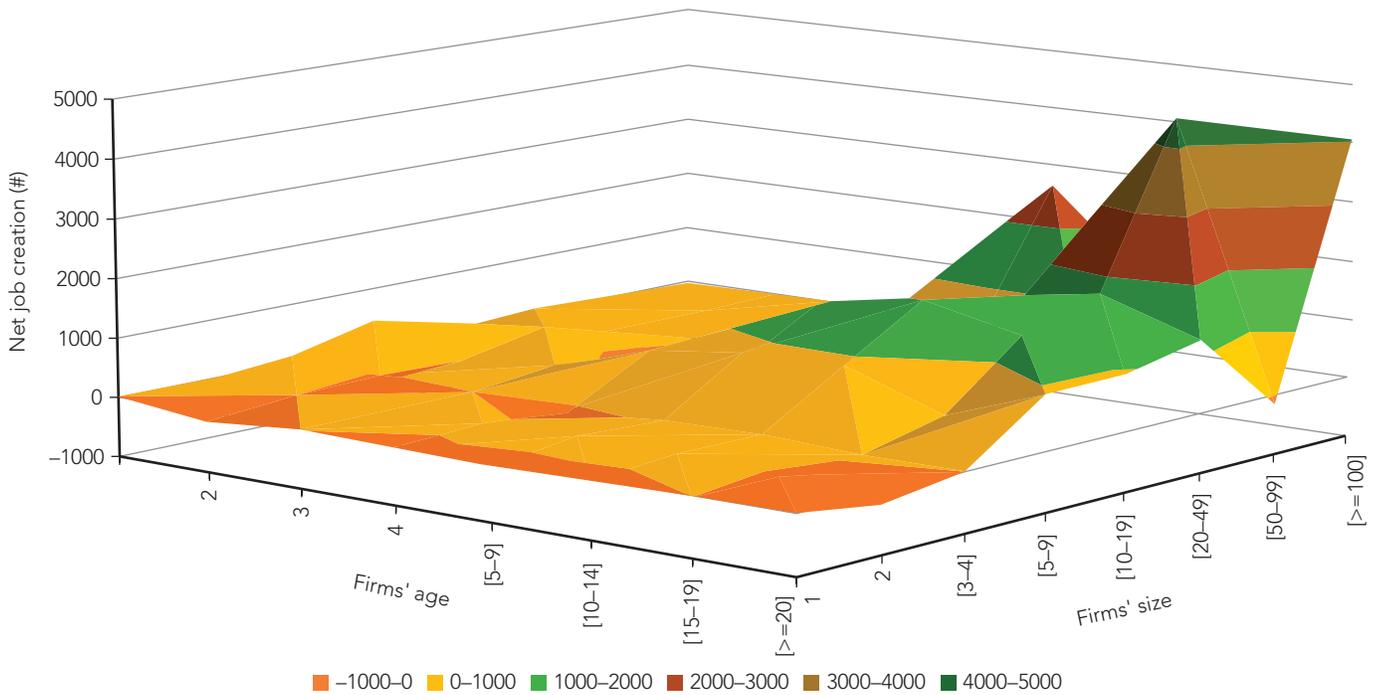
Source: Enterprise Survey 2013.

Firms larger than 100 employees accounted for 31.3 percent of net job creation between 2010 and 2013, and all firms larger than 20 employees created nearly 70 percent of the new jobs during the period (Table 2.3). Regression results support this finding and show that creation of new jobs is still primarily and significantly driven by medium and large firms of 50 workers and more (Table C.1). Firms launched after 2010 also contributed to job creation, but to a much lower extent. Furthermore, within new entrants, self-employment firms—those with only 1 employee—seem to have instead destroyed jobs.

Job creation is also mostly attributable to older firms, but the effect of age on job creation is not statistically significant. Firms in business less than 5 years contributed 8.4 percent of jobs created between 2010 and 2013 (Figure 2.10). Conversely, job creation appears to be concentrated in firms more than 15 years old, which accounted for more than 50 percent of the jobs created over the period. However, once statistical artefacts resulting from new entrant firms are removed, no significant relationship emerges between net job creation and the length of time a firm has been in existence (Table C.1).



FIGURE 2.11: Net Job Creation by Firm Age and Size, 2010–13



Source: Enterprise Survey 2013.

Clearly, net jobs are primarily created by older and larger firms. Across firm age classes, net jobs were mainly created by medium and largest firms. Between 2010 and 2013 most new jobs in formal firms were created by larger firms with longer operating histories (Figure 2.11).

Mobility in terms of firm size is relatively high among micro and small firms but more limited among large firms. Between 2010 and 2013 most micro firms, which managed to survive, grew relatively quickly. Only 39.4 percent of one-person firms in 2010 were still the same size in 2013, 15 percent of them had expanded to 2 workers, and



TABLE 2.4: Firm Size Transition Matrix, 2010–13, Percent

Size in 2010 (i)	SIZE IN 2013 (j)								TOTAL
	1	2	[3–4]	[5–9]	[10–19]	[20–49]	[50–99]	[>=100]	
1	39.4	15.2	6.2	24.6	11.1	3.6	0.0	0.0	100
2	10.7	35.5	2.1	23.5	11.3	7.4	9.5	0.0	100
[3–4]	2.2	0.4	49.0	42.8	5.0	0.3	0.2	0.0	100
[5–9]	0.8	0.9	1.0	86.4	10.8	0.1	0.1	0.0	100
[10–19]	0.0	0.1	0.1	9.5	81.0	8.8	0.6	0.0	100
[20–49]	0.0	0.0	0.0	0.1	2.7	95.2	1.5	0.6	100
[50–99]	0.0	0.0	0.0	0.0	0.0	13.6	64.4	21.9	100
[>=100]	0.0	0.0	0.0	0.0	0.0	1.5	2.3	96.2	100

Source: Enterprise Survey 2013.

Note: Cells indicate what percentage of firms in row category i in 2010 end up in column category j in 2013.

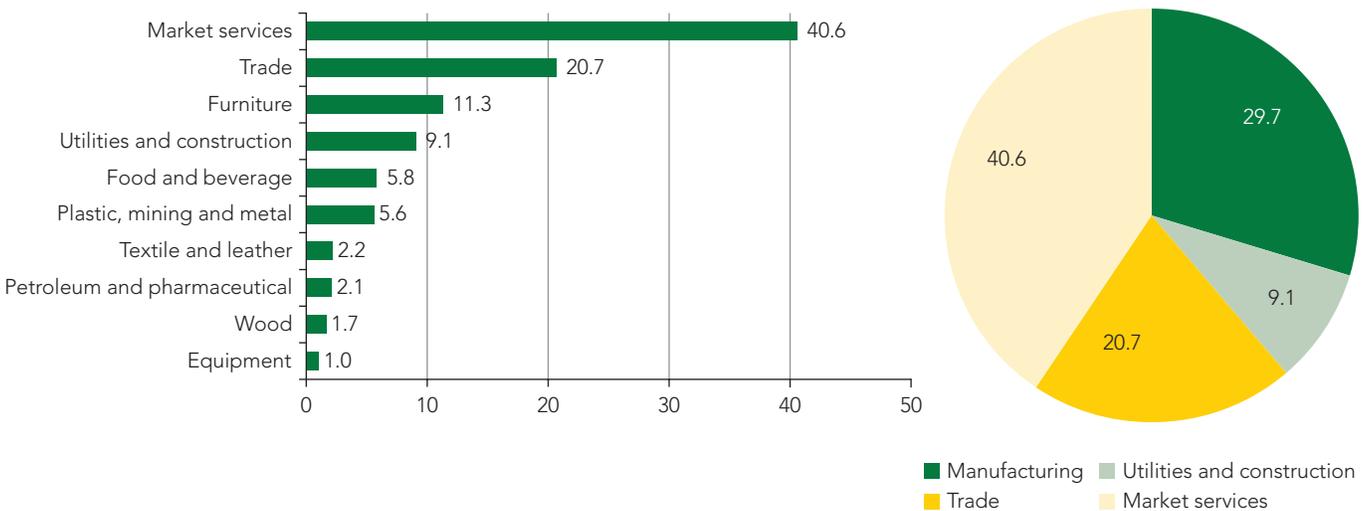
25 percent had expanded to 5–9 workers (Table 2.4). Similarly, more than half of firms that had 2 workers in 2010 had more employees in 2013. Conversely, job growth in medium and large firms seems to have slowed once firms reached at least 5 workers. In large firms, mobility between 2010 and 2013 was much lower: for instance, 95 percent of firms that had 20–49 employees in 2010 were the same size in 2013, and very few of those with more than 100 workers had changed size in 2013.

The vast majority of jobs created between 2010 and 2013 were in services. Between 2010 and 2013, 41 percent of the jobs created were in market services, which comprises hotels, restaurants, and transport services

(Figure 2.12). Manufacturing followed with nearly one-third of the new jobs created. The trade sector—wholesale and retail—accounted for 21 percent of jobs creation. Within manufacturing, most of the job creation was in furniture (11 percent), food processing (6 percent) and transformation industries (i.e. plastic, metal, chemicals) (6 percent). However, regression results show that the influence of sectors of activity on job creation is not significant when controlling for other firm characteristics, such as size and length of existence (Table C.3 in Appendix C).



FIGURE 2.12: Jobs Created by Sector, 2010–13, Percent



Source: Enterprise Survey 2013.



CHAPTER 3

Access to Finance



The critical role of financial inclusion in alleviating poverty and enhancing inclusive growth has been broadly recognized in the literature. There is growing evidence that participating in the financial system, increases people capacity to start and expand businesses, invest in human capital, and cope with shocks (Demirgüç, Kunt et al., 2015). It also contributes to empower women, and to boost productive investment and consumption. The benefits go beyond individuals, as access to finance is inextricably linked to firms' performance and growth, and therefore to jobs creations (Fowowe, 2017). Expansion of financial inclusion is gradually becoming a priority in economic development.

Access to finance can be limited by a number of factors including limited number of financial institutions, heavy collateral requirements, prohibitive costs, high levels of business informality, regulations or other market failures. The use of financial service, or financial inclusion, can be low even in the absence of lack of access as people may choose not to use financial services for a set

of different reasons. It is therefore important to measure financial inclusion and identify opportunities to remove the barriers that may be preventing the access to and use of financial services.

During the recent years, there has been a rapid surge in mobile banking in Tanzania as well as a moderate expansion of bank accounts usage. However, the access to financial services remains dominated by the heavy reliance on informal financing, and the needs of the poor and women for financial inclusion are still unmet. Limited access to formal finance services has contributed heavy concentration of businesses in microenterprises and limited growth of medium and large enterprises. Expanding access to finance and addressing unmet needs for financial inclusion have been identified among the priority policy actions to accelerate poverty reduction and shared prosperity in Tanzania. The aim of this section is to contribute to a better understanding of the potential drivers and barriers to foster financial inclusion in Tanzania, both from an individuals' and a firms' perspective.



I. Extent and Determinants of Individuals' Financial Inclusion

While half of Tanzania's population lacks financial inclusion, access to financial tools remains strongly dependent on socio-economic factors such as education and wealth.

Financial inclusion in Tanzania remains moderate as a large part of the population continues to lack any formal financial tool. We measure financial inclusion through three key indicators that are essential when measuring one's ability to access basic and critical financial tools – the ownership of a formal bank account, the possession of formal savings, and the access to credit provided by a formal financial institution (See Appendix D). According to the 2017 World Bank's Global Findex data for Tanzania, about 47 percent of the population possessed a formal bank account (Figure 3.1A). The rate of coverage of the Tanzanian population for the two other financial indicators were much lower, with 6.2 and 5.3 percent of the population that respectively had formal savings, and access to a formal credit.

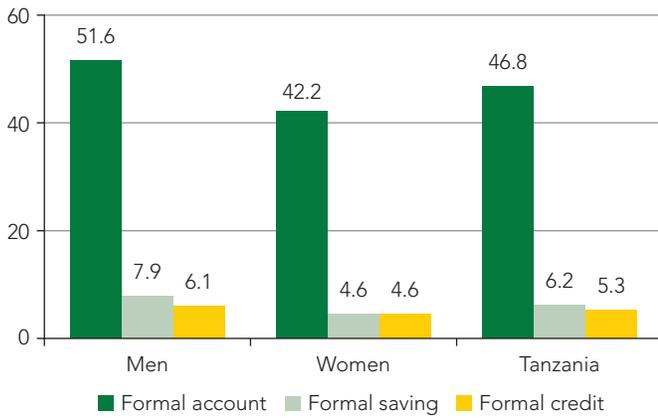
Financial inclusion is strongly determined by socio-economic characteristics. In 2017, 52 percent of men had a formal account, compared to 42 percent of women (Figure 3.1A). On average, older, better-off and more educated Tanzanians are more likely to be financially included than their younger, less educated and poorer counterparts. In particular, education and income appear as very significant factors when explaining financial inclusion (Table D.2 in Appendix D). The richer an individual, the more likely he/she is to hold a formal account, to possess formal savings and to have access to formal credit. Only 32 percent of individuals from the lowest income quintile possessed a formal bank account, whereas 63 percent of individuals from the richest quintile had one (Figure 3.1B). The same discrepancies can be observed when it comes to formal savings and formal credit. For instance, the share of individuals with formal savings is almost 7 pp higher in the richest quintile than in the poorest one. Likewise, as educational attainment increases, access to key financial tools increases (Figure 3.1C). In 2017, all

individuals with a tertiary educational level possessed a formal bank account, compared to only 41 percent of the individuals that had completed primary education or less.

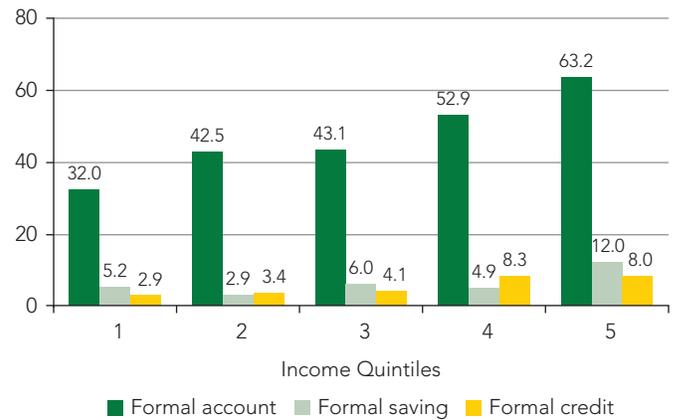
Older individuals appear to be more likely financially included. The bell-shaped curve of the share of individuals with formal bank account related to age in Figure 3.1D suggests a potential existence of a generational shift in terms of access to formal bank account, and therefore in terms of financial inclusion. This effect was more pronounced when using 2014 Findex data but seems to have continued throughout 2017. The curve based on 2017 data confirms increased financial inclusion over time and with age, as almost all age classes had higher rates of access to formal bank account in 2017 than in 2014 and as access continues to be slightly higher among older groups, except oldest ones, than younger groups. In the near future, these rates for the left tail of the curve will, most probably, continue to improve as many individuals from the youngest age groups are still in the process of acquiring formal financial tools – such as opening a formal account in a financial institution. They are also acquiring more education, which will likely increase their financial inclusion. Regression results support the positive and statistically significant effect of age on financial inclusion, with a higher likelihood for older individuals to have formal bank account, to hold savings, and to benefit from access to formal credit (Table D.2 in Appendix D). Yet, age appears to have a nonlinear relation with all indicators of financial inclusion, with a negative coefficient for age squared, suggesting that older people are more likely to be financially included, but after a certain age, the probability of being financially included declines. This is supported by the decline of the blue curve in Figure 3.1D for those aged 60 years old and above.

FIGURE 3.1: Financial Inclusion in Tanzania, 2017, Percent

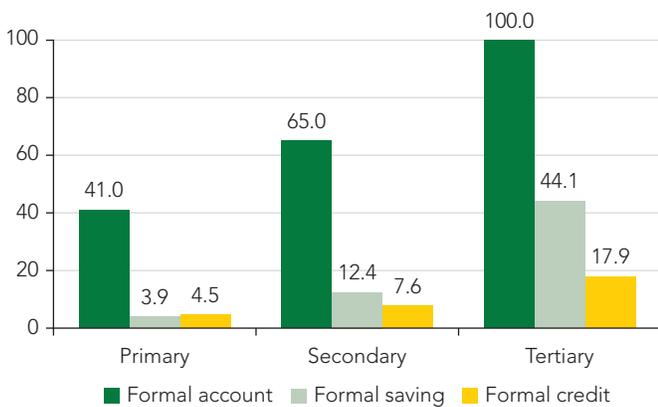
A. Financial inclusion by gender



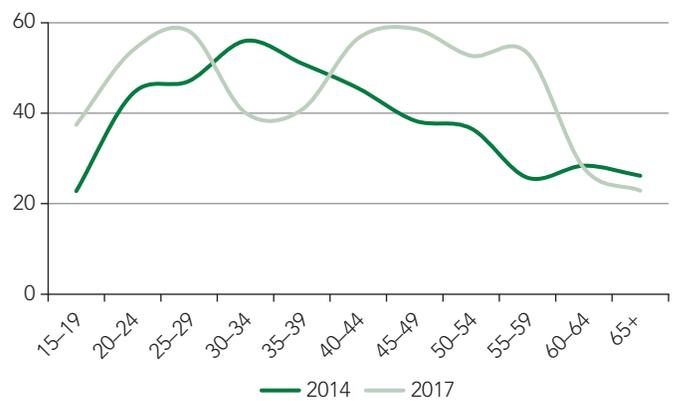
B. Financial inclusion by income quintiles



C. Financial inclusion by education



D. Formal bank account by age, 2014 and 2017



Sources: Global Findex 2014 and 2017.

Financial inclusion has progressed rapidly over the last years, primarily driven by the development of mobile banking.

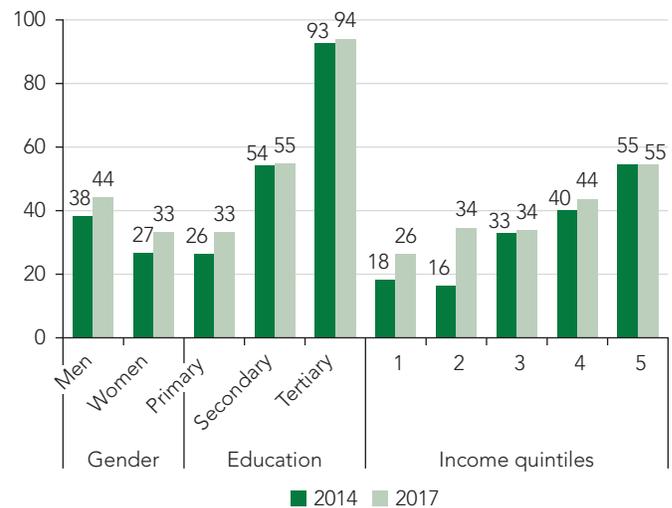
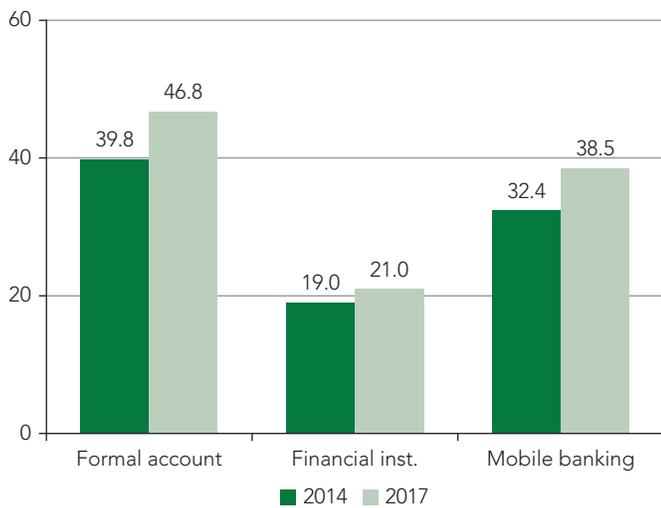
Access to formal banking accounts continues to progress, primarily because of the rapid development of mobile banking. Between 2014 and 2017, the share of the population having access to a formal bank account increased by 7 pp (Figure 3.2A). Most of the increase was driven by the development mobile money banking. Between 2014 and 2017, the share of the population with mobile bank accounts increased by 6 pp, to reach 38.5 percent.

The development of mobile banking particularly benefitted the most vulnerable individuals – low-educated and poorest individuals. An analysis of the trends in mobile banking across a set of socio-economic indicators underlines the fact that the fastest progresses were recorded in vulnerable groups of the population. Between 2014 and 2017, the share of primary-educated-or-less individuals with access to mobile banking increased

FIGURE 3.2: Trends in Financial Inclusion, 2014 and 2017, Percent

A. Formal bank account

B. Trends in mobile money banking by socio-economic characteristics



Sources: Global Findex 2014 and 2017.

7 pp, compared to 1 pp for tertiary-educated individuals (Figure 3.2B). Likewise, the share of individuals from the poorest and second-poorest quintiles with mobile banking access increased by respectively 8 and 18 pp. Conversely, the increase was much more modest or inexistent for individuals from the other income quintiles.

The central driving force behind the development of mobile banking is the sending and receiving of remittances through a mobile phone. In 2017, 30 percent of

the population sent remittances. 87.5 percent of them used mobile banking to issue the transfer, which represents 26.5 percent of the total population. Likewise, 36 percent of the population received remittances, 88.7 percent of which received the transfer through mobile banking, accounting for 32.2 percent of the total population. Overall, 41 percent of the population used mobile banking either to receive or send remittances, while only 1.5 percent used regular bank accounts, 5.5 percent used other forms of transfer such as cash.

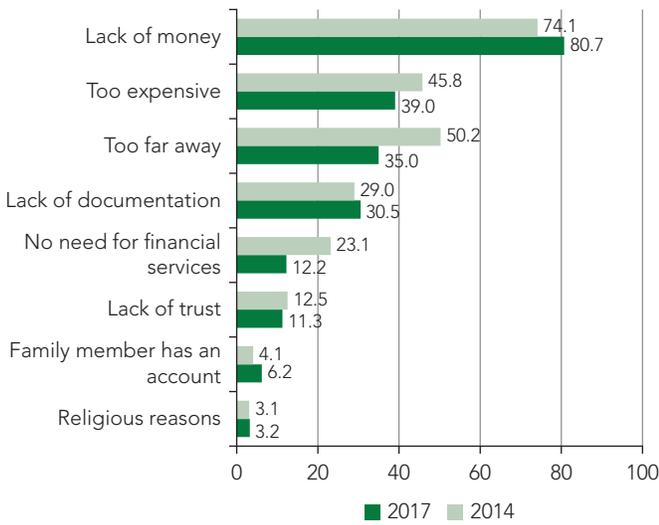
Barriers to financial inclusion are slowly decreasing, accompanying the improved financial inclusion observed.

A number of subjective barriers continue to constrain access to formal financial accounts, but the impact of some barriers is diminishing. Within the individuals that do not have a banking account registered at a formal financial institution, the most significant barriers cited are the lack of money (81 percent), the cost of opening a bank account (39 percent), and the distance from the financial

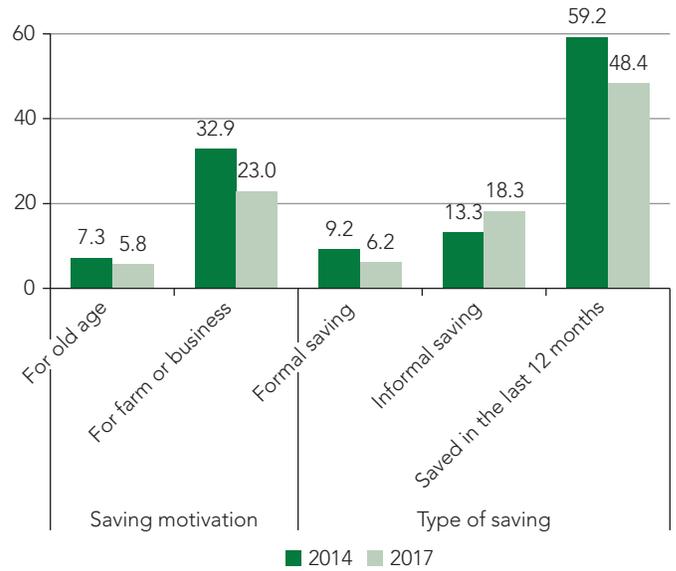
center (35 percent) (Figure 3.3A). However, compared to 2014, it seems that the proportion of the population affected by some of these barriers is slightly receding. For instance, in 2014, nearly 46 percent of individuals without a bank account cited the cost as a significant barrier, and 50 percent considered the distance to be an impediment in 2014.

FIGURE 3.3: Financial Inclusion in Tanzania, 2014 and 2017, Percent

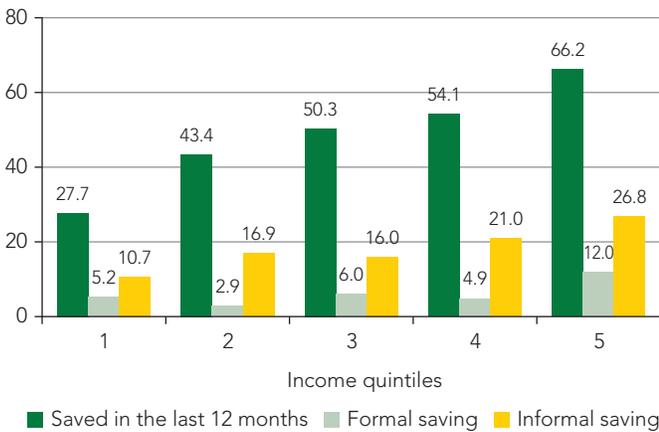
A. Barriers to financial inclusion



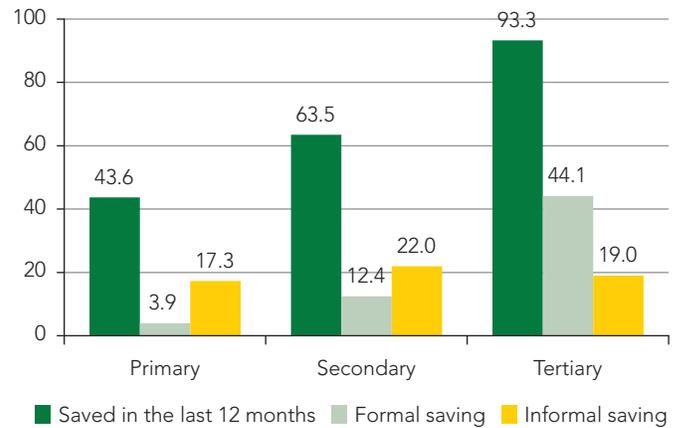
B. Type of saving and saving motivation



C. Saving by income quintiles



D. Saving by education



Source: Global Findex 2014 and 2017.

Despite half of the population saving, structured forms of saving, whether formal or informal, remain scarce, and the saving rate has been decreasing over the last couple of years.

Nearly half of the population save some money at some point, but the saving rate has decreased between 2014 and 2017. In 2017, 48.4 percent of Tanzanians declared

having saved some money at some point over the last 12 months, even if it was outside of the framework of a structured formal or informal scheme. Between 2014 and

2017, the saving rate decreased by more than 10 pp, down from 59.2 percent in 2014 (Figure 3.3B). The likelihood of saving is strongly linked to socio-economic factors: saving appears primarily and significantly correlated to older age, higher income, and higher education (See Table D.5 in Appendix D), highlighting the role played by financial literacy and education in the choices made by individuals with regards to the saving of their income. While the saving rates of the individuals from the poorest quintiles stands at about 28 percent, it reaches 66 percent for the richest one (Figure 3.3C). Likewise, 44 percent of primary-educated individuals saved some money over the last 12 months, compared to 93 percent of tertiary-educated individuals (Figure 3.3D).

Meanwhile, structured forms of saving, whether formal or informal, remain scarce and subject to socio-economic factors. The use of structured forms of saving remains very limited (Figure 3.3B). Only 6.2 percent of individuals used a formal saving scheme, down from 9.2 percent in 2014, and 18.3 percent of them saved or set aside money by using an informal saving club or a person outside the family (+ 5 pp between 2014 and 2017), suggesting most of the saving occurs within the family circle and primarily consist of setting money aside, therefore not benefiting from any remuneration. Formal and informal savings are driven by distinct socio-economic dynamics. Formal saving is primarily and significantly correlated to higher education; informal saving schemes are more likely for individuals with lower educational attainment (Figure 3.3D and Table D.5 in Appendix D). Above

all, the likelihood of informal saving is very strongly correlated with gender, undermining the role played by women in developing and using informal saving schemes such as rotating savings and credit groups *upatu* or other saving clubs. While around 13 percent of men resort to an informal saving scheme, the proportion rises to 24 percent in the case of women.

Saving is mainly driven by business purposes, while saving's strategies for retirement underscore the role played by education. The objective of saving is primarily to pursue a business opportunity. About 23 percent of Tanzanians save in order to invest in future economic assets – in a farm or in a business. Retirement purposes only concerns 6 percent of the surveyed individuals (Figure 3.3B). The latter motive is particularly important for tertiary-educated individuals as 26 percent of them save for old age compared to only 5 percent of primary-educated individuals, underscoring the effect of education on the ability to plan the future and on the knowledge of the benefits of saving. The regression results show that the likelihood of saving for retirement is significantly higher for better-educated individuals, and the likelihood of saving for business purposes is significantly higher for individuals from the richest income quintiles (Table D.6 in Appendix D). Indeed, the proportion of individuals from the richest quintile that save for business or retirement purposes is much higher than in the lowest quintile (respectively +18 and +6 pp differences)

Access to credit remains widely informal, primarily relying on family, friends, and saving clubs.

Access to credit is achieved primarily through informal arrangements, across all educational and income groups. While around 42 percent of the population has access to some form of credit, 32 percent of Tanzanians rely on informal credit sources, compared to only 5 percent who use credit arrangements from formal financial institutions (Figure 3.4A). Educated individuals are more likely to access credit (39 percent for primary-educated individuals compared to 83 percent for tertiary-educated ones), with a similar pattern and significant likelihood observed for both formal and informal credit (Table D.8 in Appendix D). Only 5 percent of primary-educated people are able to secure formal loans, compared to 18 percent of tertiary-educated individuals. Looking through the wealth perspective shows that differences in

access to credit across income quintiles exist but are not as important as between education groups. In particular, access to informal credit is similar across all quintiles, concerning around one-third of individuals in each income quintile (Figure 3.4B). However, richer individuals appear more likely to secure a formal loan with the rate of access to formal credit increasing as income increases (poorest quintile: 3 percent; richest quintile: 8 percent).

The role played by saving clubs as well as families and friends to provide such informal credit is very important. The informal credit in Tanzania primarily relies on family sources and saving clubs. In 2017, about 28 percent of individuals had borrowed in the last 12 months from family

or friends, and more than half of the population (53 percent) resorted to saving clubs. Interestingly, the share of individuals resorting to saving clubs is higher for those

from the poorest quintiles, underlining the role played by informal saving schemes to provide credit to a large part of the population with not enough collateral nor resources to seek a formal loan (Figure 3.4D).

FIGURE 3.4: Financial Inclusion in Tanzania, 2017, Percent



Source: Global Findex 2017.

II. The Effects of Access to Finance on the Growth of Tanzanian Firms

Access to finance is perceived as a major obstacle to formal firms' operations.

Tanzania's formal firms perceive access to finance as a major and increasingly important obstacle. The 2013 Enterprise Survey collects data for formal firms operating across all sectors. When asked to name the most severe obstacle to their current operations, 38 percent of the 2013 Enterprise Survey's respondents identified *Access to Finance*, ranking the constraint first out of all the possibilities (Figure 3.5A). Furthermore, the perception of access to finance from 2006 and 2013 seems to have worsened. In the 2006 Enterprise Survey, around 46 percent of the respondents identified access to finance as not being an obstacle or only a minor one. In 2013, the proportion had decreased to 29 percent. Conversely, the share of respondents considering access to finance as a moderate, major, or very severe obstacle had increased from 54 percent to 71 percent (Figure 3.5B).

In particular, access to finance tends to be perceived as a major obstacle by smaller firms. Not surprisingly, the perception of access to finance as a constraint and an obstacle tends to decrease with size of the firms. Only 28 percent of Tanzanian companies that have 10 employees or less do not consider access to finance as an obstacle or only a minor one, while the rate increases to 69 percent in the case of companies with more than 200 employees (Figure 3.5C). Conversely, 23 percent of *Large* companies see access to finance as a major or severe obstacle, compared to 39 and 52 percent of *Micro* and *Small* firms respectively.

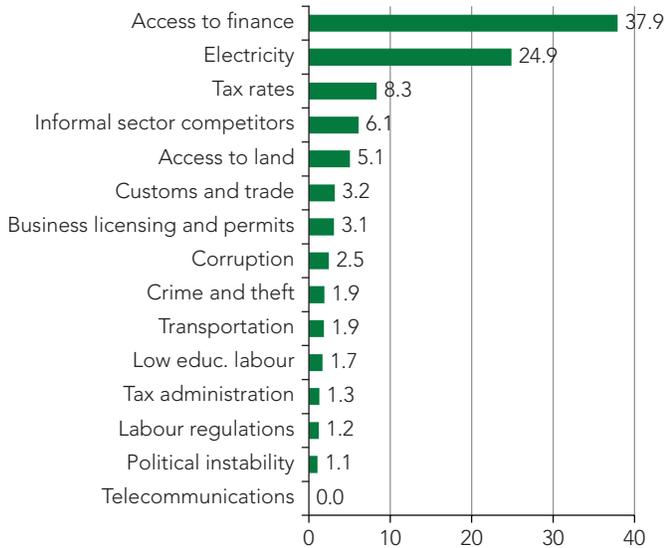
However, the empirical analysis shows that the growth of Tanzanian firms is not significantly affected by

credit constraints. Even though the large majority of Tanzania's firms perceive to be financially constrained, the empirical analysis of the effects of access to finance on their performance shows that credit constraints do not have a significant adverse effect on their growth—proxied by the growth of the number of employees (See Appendix E for more details). Performing econometric estimations—using regressions on data from the 2013 Enterprise Survey—we find that the subjective measure of access to finance, obtained from the ranking of access to finance as no obstacle or severe obstacle to business operations, has a statistically significant negative effect on firms growth, suggesting that inadequate financing is a serious constraint that Tanzanian firms face (Table E.2 in Appendix E). However, objective measures of access to finance based on whether firms are constrained in obtaining credit or not indicate that access to finance constraint does not exert a statistically significant negative effect on firms growth.¹ The only conclusive and significant results obtained are for the credit constrained status, which indicate that firms that are moderately credit constrained tend to grow more than firms that are fully credit constrained (Table E.3 in Appendix E). Nevertheless, the results do not reveal any significant effect of loans, credit lines or overdraft on firms growth. This is probably due to both the small size of the sample and the overall limited access to credit, as only few large firms benefit from this access and their potential to grow is lower than small and medium firms.

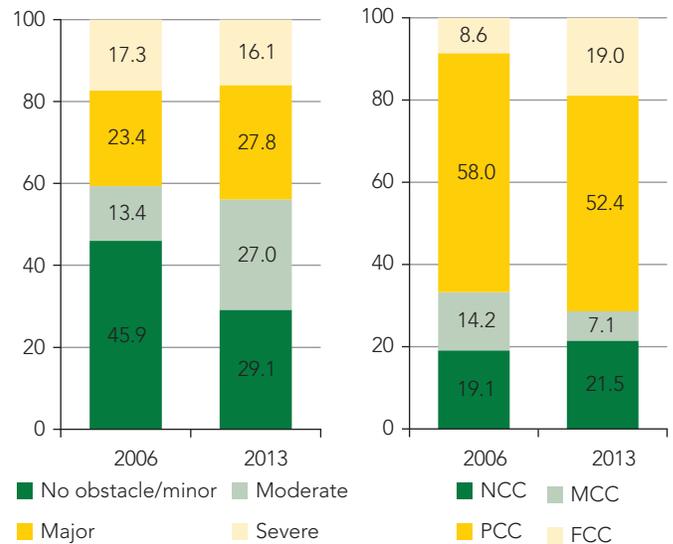
¹ The descriptive statistics from the 2013 Enterprise Survey show that large firms tend to have more access to finance, in particular, to evolved financial tools such as overdraft facilities and credit lines in formal financial establishments (Table E.1).

FIGURE 3.5: Access to Finance of Formal Enterprises, 2006 and 2013, Percent

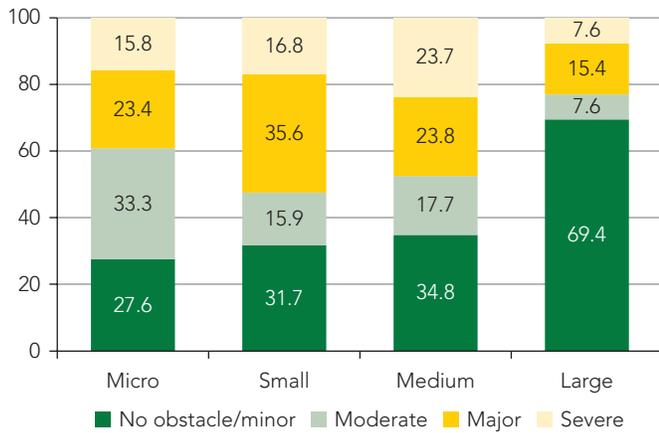
A. Most severe obstacle to operations



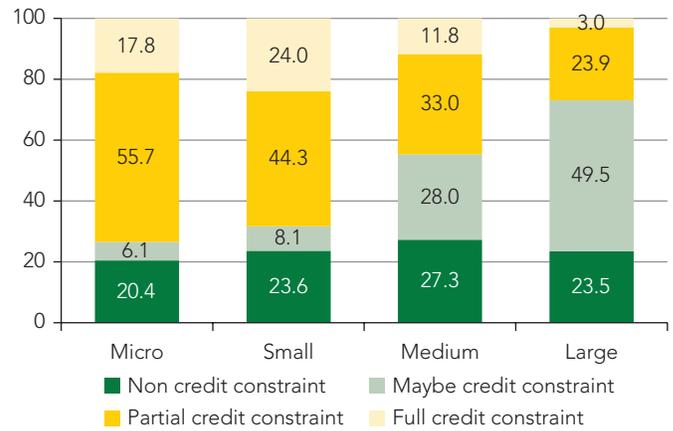
B. Perceived vs objective financial constraint, 2006 and 2013



C. Perceived financial constraint by firms' size



D. Objective financial constraint by firms' size



Source: Enterprise Surveys 2006 and 2013.

Notes:

- Firms' size is as follow: *Micro* (10 employees or less), *Small* (11 to 50 employees), *Medium* (51 to 200 employees), and *Large* (more than 200 employees).
- Objective measure of financial constrain is as follow: *NCC* (Non-Credit Constraint), *MCC* (Maybe Credit Constraint), *PCC* (Partial Credit Constraint), and *FCC* (Full Credit Constraint) – See Appendix E for more details.

Around one third of industrial firms, whether formal or informal, report facing inadequate financial services.

Around one third of industrial firms feel financially constrained, with higher constraints perceived by smaller firms. Overall, 29 percent of Tanzania’s industrial firms from the 2013 Census of Industrial Production (CIP) declare that inadequate financial services constitute a major challenge. Disaggregation by firms’ size shows that the financial constrain tends to decrease as enterprises’ size increases (Figure 3.6A).

For instance, while 29 percent of *Micro* industrial companies – between 1 and 10 employees—report inadequate financial services as an obstacle, only 16 percent of *Large* industrial enterprises – more than 200 employees— feel financial constrained. The prevalence of inadequate financial services also appears slightly higher for informal industrial companies than for formal ones.

Very few informal households’ enterprises are able to secure a loan for their operations, and mostly rely on micro-credit organizations.

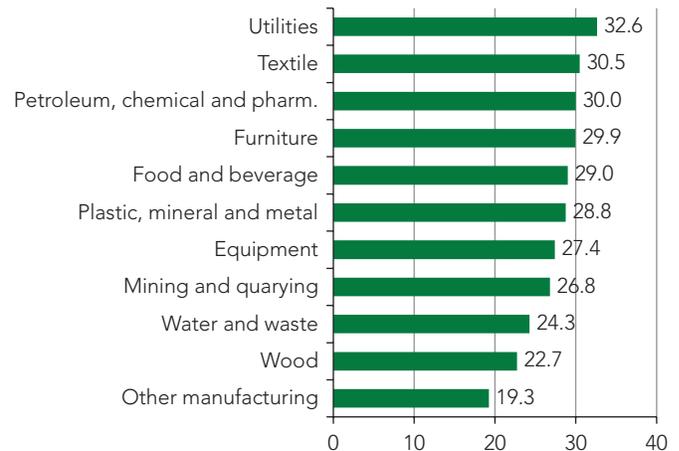
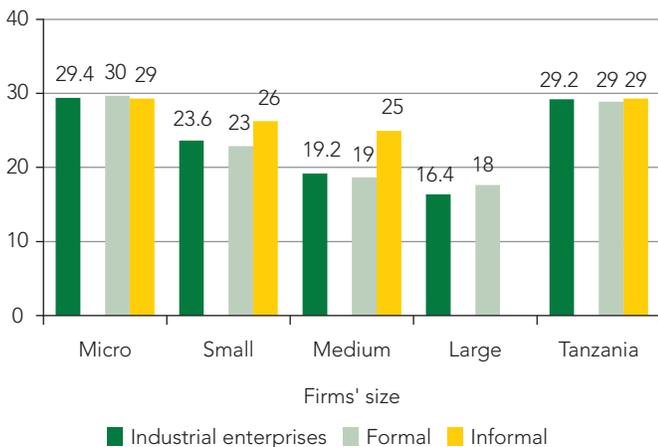
Only one tenth of informal household enterprises have access to credit, which primarily comes from micro-credit entities or informal credit channels. At the national level, only 9 percent of informal household enterprises were able to secure a loan to develop or support their business operations (Figure 3.7A). The rate increases to 12 percent in the case of household enterprises operating in urban environment, and to 12 percent for household enterprises in the services’ sector. Most informal household enterprises that obtained a loan

resorted to micro-credit entities or informal credit channels such as SACCOS (Savings and Credit Co-Operative Society), private money lenders, or *upatu* schemes: 40 percent of the household enterprises that contracted a loan did so through SACCO and 20 percent through private money lenders. In comparison, on top of the low lending rate, only 18 percent of household enterprises that took a loan resorted to a traditional and formal bank (Figure 3.7B).

FIGURE 3.6: Access to Finance of Industrial Enterprises, 2013, Percent

A. Perceived financial constrain by firms’ size

B. Perceived financial constrain by manufacturing sub-sector

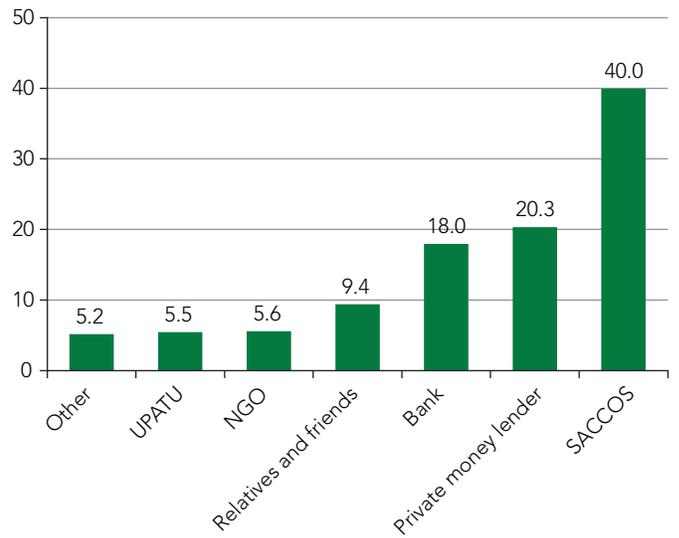
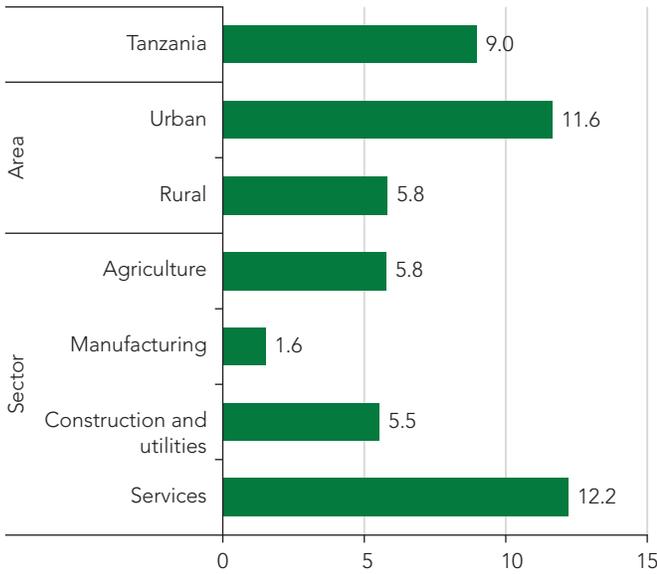


Source: CIP 2013.

FIGURE 3.7: Access to Finance of Informal Household Enterprises, 2014, Percent

A. HH Enterprises with a loan

B. Sources of loan (% of HH Enterprises with a loan)



Source: 2014 Integrated Labor Force Survey.



CHAPTER 4

Economic Choices by Socially Embedded Individuals: recent advances in economics research and their potential implications for informal finance in Tanzania



Occupational choices and structural change are central issues within poverty and development discourses.

The relationship between poverty and structural change has been central to the debate about economic development in developing countries.

The economic development of most European countries over the past few centuries was accompanied by two major structural changes: the population became more urbanized, and the rural population became more involved in non-agricultural activities (Allen, 2000). Within a few generations, the diversity of possible occupations and income sources was expanded, and large swaths of the population chose to transition from farming to other types of economic activities. While a qualitatively similar evolution can be observed over the past few decades in Sub-Saharan African (SSA) countries, this evolution is still far from having brought these countries to par with developed ones (McMillan, Margaret, and Kenneth Harttgen, 2015; Davis, Di Giuseppe, and Zezza, 2017). Furthermore, it is important to keep in mind that structural change does not necessarily reduce economic inequality, as has been shown in work on historical data from Europe and the Americas (Lindert and Williamson, 2017).

It is important to consider the global environment in which structural change in Sub-Saharan Africa takes place today.

Now, it may be erroneous to believe that the evolution in SSA must necessarily follow the exact same path as Europe to reach similar levels of economic development (McMillan, Rodrik, and Sepúlveda, 2015). The contexts are simply too different, for many reasons, of which we here name three. First, while in historical Europe trade in agricultural produce was largely in-existent, for the past 20 years SSA's share in global exports was higher for agricultural products than for goods in services in general (Badiane, Odjo, and Collins, 2018). Second, today's overall economic landscape cannot be compared to the one in historical Europe, in which large multi-national players in the manufacturing and financial sectors were essentially in-existent. Third, while modern technology facilitates access

to information and to markets, one must keep in mind that access to such technology is by no means universal. As such it may, in theory, exacerbate rather than alleviate inequalities, although a recent study suggests that the overall impact of fast internet on job creation and on average income in Africa has so far been positive (Hjort and Poulsen, 2019).

Occupational choice is at the heart of structural change.

Ultimately, however, as was the case in historical Europe, the future of SSA will be determined by its inhabitants' occupational choices. These will determine not only the supply of goods and services, but also the overall distribution of risk in the economy, the land use patterns with its ensuing ecological consequences, the migration patterns with its implications for the evolution of urbanization rates and other social dynamics, as well as the long-term returns to human capital. A thorough and comprehensive understanding of the determinants as well as the effects of occupational choices is thus key to achieve effective and desirable policy design. This chapter makes an attempt at summarizing some important issues which are still not well understood. The next section exposes the general arguments. It will be followed by an examination of the situation in Tanzania.



I. What do We Know About Occupational Choices?

What are the drivers of an individual's occupational choice? This section summarizes the traditional model used

by economists to approach this question, and then examines complementary approaches.

A. The Classical Model of Occupational Choice in Economics

Is the lack of access to credit the real problem?

The early economics literature on occupational choice focused on the lack of access to finance as a source of inefficient occupational choice. The most prominent classical models used to analyze the determinants of occupational choice typically share two features.¹ First, focus is on the choice between a small number of options, which differ qualitatively in certain economic dimensions. Second, individuals are taken to care solely about the consumption benefits (utility) that their net income confers on them. In the influential model proposed by Banerjee and Newman (1993), there are three occupational statuses (that require the individual to supply labor): (i) self-employed; (ii) entrepreneur with employees; (iii) employee. All categories may appear in any sector of the economy, including the agricultural one. The occupational categories differ in the inputs that they require: capital is required for (i) and (ii) but not for (iii), and more capital is required for (ii) than for (i). The set of choices accessible to an individual thus depends on his or her access to funds (either through savings and/or through credit). The focus of the analysis is on how constrained access to credit affects occupational choice and the ensuing wealth dynamics.

The early economics literature on micro-finance was highly optimistic about the potential of micro-credit institutions. The belief that restricted access to finance is a major cause behind the lack of structural change, induced massive attempts to enhance access to credit by way of setting up micro-credit institutions. In particular, economists believed that the lack of access to credit was mainly explained by

a combination of (1) the presence of predatory moneylenders, and (2) a lack of incentives for individuals to pay back their loans unless lenders could access information about borrowers' ability to reimburse. Micro-finance was believed to solve these two issues: interest rates would be much lower than those charged by the traditional moneylenders, and credit extended to groups rather than to individuals was expected to provide incentives for individuals to reimburse (since the group members could monitor each other's activities).

Traditional micro-credit institutions did not prove to be as efficient as expected, but recent research has unveiled potential for improvement. In its early phases, micro-credit failed to deliver the improvements it was expected to generate; while it increased the consumption of durable goods and had a positive impact on business creation, these effects were often modest, and they did not lead to an overall increase in consumption levels (Banerjee, 2013). Some recent experimental research, however, suggests that certain modifications in the design of micro-credit institutions may turn out to significantly improve their economic impact. For example, in a field experiment in India, Maitra et al. (2017) find that when local traders (typically the owner of a local shop) were given the opportunity to have a say in which individuals could benefit from a micro-finance loan (what they call trader-agent-intermediated lending, or TRAIL), the performance of the micro-credit was enhanced. In the villages they study, they find that, compared to traditional group-based lending, TRAIL enhanced the incomes of farmers on average

¹ The standard economics model of individual choice is straightforward: among the options available in the individual's *feasible set*, the individual selects the one ranking highest according to his or her *personal preferences*.

by 22 percent. There is nonetheless still widespread belief that the determinants of the performance of credit markets in developing societies are far from being well understood, and this issue will be examined in greater detail below.

By relying on a simplistic view of human motivation, the classical model of economic choice fails to adequately inform policy design. The traditional analysis may still miss key driving forces behind the choices an individual makes. The standard approach in economics, which consists in viewing individuals as simply seeking to maximize own income, is at odds with the way any other scientific discipline views the drivers of human behavior. If the goal is to distill the effects of income maximization from those of other motivations, one can defend the modeling approach of asking: how does income maximization affect occupational choice (and more generally behavior). However, approach can be problematic if behavior induced by other dimensions of human motivation

are correlated with the goal of income maximization. Neglect of these other dimensions then leads to biased results, even if the scientist or the policymaker is solely interested in understanding how individuals go about to reach income goals. This neglect may turn out to be particularly troublesome when it comes to understanding the early phases of economic development, which are complex and associated with important structural and societal changes, as mentioned above.²

The theory of human behavior is increasingly influencing the modeling of individual decision-making. In the past decades, the economics discipline has increasingly relied on a theory of human behavior which includes human motivational factors beyond income maximization. The following discussion summarizes some of the contributions to this literature, with a focus on motivational factors which are thought to be of particular interest for developing economies. This summary is by no means exhaustive, however.

B. Occupational Choice Under a More Complex Set of Motivations

Human beings belong to social networks. The classical economics model assumes that individual operates independently from others. Specifically, both the income (or more generally the set of options an individual has access to) and the personal preferences of any given individual are presumed to depend only on his or her own actions. But, in essence, all human beings belong to one or several social networks, including the family, networks based on friendship or physical proximity, perhaps a religious community and so forth (Jackson, 2019). Arguably, this is particularly true in societies where only a

minority of the population is employed by some formal institution, such as a private firm or a public agency. Ties with social networks can be particularly strong among population groups exposed to risks and vulnerability, and where formal insurance mechanisms and strong institutions are lacking. Membership in such networks may have a non-trivial impact on: (i) the options to which an individual has access; and (ii) his or her goals. Taken together, these two effects imply that membership in such networks may have a significant impact on individual behavior. The two effects are examined in turn.

Membership in social networks: Do informal transfers matter for occupational choices?

Social networks are important sources of informal risk sharing and informal credit: this may in turn impact productive efforts. Membership in a network can potentially affect the set of options that an individual has access to in

many ways. For example, the set of job opportunities can depend on the individual's network contacts (Granovetter, 1973, Lalanne and Seabright, 2011); more specifically, relatives or friends of individuals in remote villages, who live in

² The traditional model of occupational choice described above can be criticized on other grounds as well. In particular two comments are in order. First, in most variants of such models it is assumed that individuals have access to complete and accurate information about the options that exist, and about the investment costs and income distributions associated with them. This is clearly a very strong assumption, even when applied to individuals in developed countries. Second, the classical model disregards the effects of malfunctioning institutions and inadequate infrastructure (Laffont, 1998) as well as attitudes towards institutions (Alesina and Giuliano, 2015). A useful version of the baseline model must accommodate these factors. If good enough data is available, such a model may serve as a basis for empirical analysis of individual occupational choice.

cities, may open doors to urban occupations. However, and arguably more relevant in the context of developing countries, networks are a source of risk sharing (Rosenzweig, 1988, Udry, 1990, Townsend, 1994), and more generally of informal transfers (Cox, Galasso and Jimenez, 2006, Fafchamps, 2011). The anticipation of being on either the receiving or the giving end of such transfers may impact an individual's incentives to invest or undertake productive efforts, or to make a particular occupational choice. It may seem intuitive for economists to hypothesize that informal transfers that reduce the risk to which an individual is exposed, necessarily induce lower efforts, as in the classical moral hazard model (Arrow, 1963, Pauly, 1968, Arnott and Stiglitz, 1988); indeed, intuition suggests that someone who expects to be fully or almost fully compensated in case of a loss, has a low incentive to self-protect against the loss in the first place. However, if informal transfers are driven by an intrinsic desire to share, such as altruism or warm glow, individuals may be expected to internalize the external effects of their efforts on others; for example, an individual who is happy to help out his relatives, or who derives social status from doing so, may work more than he/she would absent such helping behavior. Recent theoretical research shows that the moral hazard effect may be outweighed by this positive incentive effect, resulting in a net positive effect of informal transfers on productive efforts (Alger and Weibull, 2008, 2010).

Omitting the potential effects of informal transfers in decision making can be misleading. Whether the effect turns out to be positive or negative in practice, the key point is that any relationship between informal transfers and efforts implies that the classical model of individualistic decision-making is misleading. Thus, if transfers have a detrimental effect on effort, they may hamper economic development, even though they enable risk sharing; if they have a positive effect on effort, they help promote economic development above and beyond the benefits of risk sharing.

Recent empirical and experimental work conducted in some African countries suggests that “kin taxes” impact productive efforts and/or savings patterns. Studies based on data collected in certain parts of Africa suggest that the expectation that one should share income with kin (i.e., the expectation that one should pay a “kin tax”) on average tends to have either no effect or a detrimental effect on productive efforts, investments, and/or savings. Azam and Gubert (2005) and Baland

et al. (2016) show that individuals who are on the receiving end of transfers (from emigrated relatives in the former study, from older siblings in the latter study) work less compared to those who are not. Di Falco and Bulte (2013) find a negative correlation between the presence of relatives and levels of self-protection. A number of empirical and experimental studies³ suggest that individuals undertake strategies to avoid having to share with kin (i.e., family, relatives).⁴ Finally, some empirical studies⁵ indicate that kin taxes may be responsible for a substantial number of “missing entrepreneurs”, i.e., individuals who due to the kin taxes choose to refrain from engaging in entrepreneurial activities. In sum, this research underlines the need for a better understanding of the effects of informal transfers in networks of family, friends and neighbors.

There are costs and benefits of leaving an informal network; these are not yet well understood. Social networks are not fixed, and they depend on the individuals' decisions to participate in such networks (Barr and Genicot, 2008, Attanasio et al., 2012, Banerjee et al., 2013). Although the factors that influence these decisions are not yet well understood, there is now a growing body of research on this. In this respect, the contributions by Kranton (1996) and Banerjee et al. (2018) offer interesting insights. In Kranton's (1996) theoretical model, individuals face a choice between remaining in an informal network with reciprocal and personalized exchange of goods and services and leaving the network to trade goods and services anonymously in a market. It is shown that the informal network can be sustained even if everybody would be better off if they switched to market exchange. The intuition is straightforward: when markets are thin, then an individual who leaves the reciprocal network has to spend a lot of time searching for the goods (s)he wants. In other words, the cost of leaving the reciprocal network is too high for any given individual. However, if everybody moved to market exchange, then it would be easy to find goods, and specialization would imply that more goods would be available than in the reciprocal network. Perhaps this theory may help explain occupational choice in some developing economies, and the ensuing dynamics of structural change.

Data on the endogenous formation of networks, and on how this process depends on economic factors, is necessary for a better understanding of their effects on the decision-making process.⁶ The data collected and analyzed by Banerjee et al. (2018) provides one of the first

³ See Baland, Guirkinger, and Mali (2011), Di Falco and Bulte (2011), Dupas and Robinson (2013), Jakiela and Ozier (2016), and Boltz, Marazyan, and Villar (2016).

⁴ By contrast, a study in rural Mexico based on a novel experimental design, which allows the authors to compare real effort choices in the presence and the absence of transfers, finds that on average transfers have a positive or no effect on efforts chosen by the participants in the study (Alger et al., 2018).

⁵ See Grimm, Hartwig, and Lay (2016), Squires (2016), and Alby, Auriol, and Nguimkeu (2019).

⁶ See Jackson and Storms (2019) for a recent methodological contribution on how network structure can be inferred from behavioral data.

steps in this direction.⁷ The authors exploit variation in the rolling out of microfinance in villages in India to compare the network dynamics in exposed villages to that in non-exposed villages. They find that exposure to micro-finance induces a significant reduction in the number of network links over time.

There is mounting evidence that family structure and interactions vary across the world; the consequences of this variation are poorly understood. In recent decades, economists have also increasingly recognized the role that the family plays in shaping individuals' economic decisions, and ultimately economic growth (Becker, 1991, Greif,

2006, Alesina and Giuliano, 2010). Relatedly, some recent theoretical work suggests that the strength of family ties may have evolved differently in different parts of the world in pre-industrial times (Alger and Weibull, 2010), and there is evidence that family structures as well as inheritance patterns still vary systematically between different parts of the world (Todd, 2011). Taken together, these strands of literature further weaken the case for economic models in which individuals operate independently of their social environment.

How do ties with social networks impact preferences?

It is increasingly recognized that individuals care not only about their absolute income but also about how their income compares to that of others. Seventy years ago, Duesenberry (1949) proposed in his PhD thesis that individuals care not only about their own absolute income, but also about their income relative to that of others. While this *relative income hypothesis* did not make it into the classical economics models (Frank, 2005), in recent decades similar ideas have been taken into account in several strands of economic research, including behavioral economics, research on incentives in organizations, and in more general accounts of human behavior.⁸ Furthermore, the idea that identity matters has also made its way into economics (Akerlof and Kranton, 2000), as has the notion that homophily, i.e., the tendency for individuals to interact preferentially with those who share some characteristics with them, may influence labor market outcomes. For example, a tendency for individuals to interact preferentially with people who have the same occupational status as them, may exacerbate unemployment by rendering it more difficult for unemployed individuals to create social ties with employed people (Bramoullé and Saint-Paul, 2010). Similarly, people from poor backgrounds may be at a disadvantage when it comes to building social ties with individuals from higher socio-economic status groups, and this may in turn put them at a disadvantage when it comes to acquiring information about employment opportunities.

An individual's social environment may influence his or her aspirations, and therefore also his or her decisions on savings and productive efforts. What are the

implications of such aspects of human motivation for occupational choice in emerging economies? While this is ultimately an empirical question, theory indicates that the implications can be significant. To wit, consider the model proposed by Genicot and Ray (2017) on the long-run dynamics of the wealth distribution in a society.⁹ In the model, individuals allocate income between consumption and savings for their children. Each individual is driven by a desire to achieve a balance between on the one hand, utility derived from own consumption, and on the other hand, utility derived from seeing one's child surpass some aspirational goal. The model encompasses many kinds of aspirational goals, including the objective to climb the income ladder. The key point of the model is that while realistic aspirations foster savings and therefore also an increase in wealth across generations, highly ambitious aspirations render the cost of attaining them so high that savings are discouraged. It is shown that, under quite general conditions, this can lead to income stagnation at the lower end of the income distribution and an ever-increasing widening of the income gap across generations. Concretely, aspirations may have a negative impact on the productive efforts of individuals at the lower end of the income scale, by (1) either inducing a low level of aspiration in them (this would be the case if they simply seek to keep up with their neighbors' incomes, and housing is segregated), (2) or by inducing a feeling of discouragement (this would be the case if they try to aim too high). Ultimately, however,

⁷ The data can be downloaded from <https://dataverse.harvard.edu/dataset.xhtml?persistentId=hdl:1902.1/21538>.

⁸ See for example Fehr and Schmidt (1999); Bandiera, Barankay, and Rasul (2010), and Frank (1985).

⁹ See also Bénabou and Tirole (2006).

whether aspirations have a positive or a negative impact is an empirical question.

More research on how participation in social networks (as well as exposure to media and social media) affects individuals' preferences and goals is necessary to achieve a better understanding of occupational choice in developing countries. Empirical evidence shows that exposure through television and social media to social milieus and behaviors that they are rarely (if ever) exposed to in real life, has an impact on behavior. For example, Jensen and Oster (2009) show that the introduction of cable and satellite television had a positive impact on women's status in rural India (attitudes towards domestic violence toward

women changed, women's autonomy increased, and fertility decreased). The presumed mechanism is that exposure to social norms and standards of living in other parts of the world through TV shows influences attitudes (La Ferrara, Chong, and Duryea, 2012). Moreover, it is increasingly recognized and documented that pro-social preferences vary between different parts of the world (Falk et al., 2018). Together with the theoretical model described above, this evidence begs the question of how preferences are shaped in the first place, and how the evolution of preferences in a society contributes to the long-run dynamics of behaviors such as savings, productive efforts, and occupational choice.



II. Structural Change in Tanzania: The Role of Household Enterprises

Household enterprises offer a potential for structural change, but their role is limited by the lack of finance.

As seen in the previous chapters, Tanzania's population is increasingly relying on non-agricultural activities and Household Enterprises (HEs) as a source of income. HEs can drive the process of structural transformation, and hence poverty reduction and development.¹⁰ Yet, these enterprises appear to face a number of challenges, which hamper the functioning of existing HEs and the creation of

novel ones. In particular, the lack of finance is perceived as a major issue by HE owners.¹¹ Hence, the discussion in this section centers on the lack of access to credit. Two aspects revealed by the data pertaining to access to funding are examined below, in light of the recent developments in economic research summarized above. The overarching goal is to provide food for thought, that may ultimately help improve access to finance for current and prospective HE owners in Tanzania.

HEs are often funded through informal credit from relatives, neighbors, and friends: what are the implications of this state of affairs for the efficiency of HEs?

Survey data shows that the major part of the money borrowed to fund HEs comes from informal sources.

In the absence of access to a formal banking sector, individuals may resort to a number of alternative informal arrangements to enhance their access to funds (see Chapter 6 in Part I and Chapter 3 in Part II of this report). In a survey conducted by Sánchez Puerta et al. (2018), the respondents report that more than 80 percent of their borrowed money comes from informal sources, of which half comes from friends and neighbors, and a quarter from relatives.¹² These figures clearly mean that friends, neighbors, and relatives are the most important source of funding for HE owners. In light of the recent literature on the effects of informal transfers (summarized in the previous section), this fact begs the question of how such informal funding affects the incentives to undertake

productive efforts or save in the first place, compared to credit from formal sources. In particular, little is known about the implications of the fact that credit to HEs stem mostly from neighbors, friends, and relatives, although several questions appear of high relevance.

First, does the ease of access to informal credit from neighbors, friends and relatives imply that debtors make more or less effort to ensure prompt and full reimbursement, compared to if they had access to credit only from formal sources?

An individual who borrows from a relative may be more or less prone to reimburse the loan than if (s) he had instead borrowed from a formal financial institution. On the one hand, (s)he may care more for the relation (s)he has with the relative, and will therefore make a greater effort to

¹⁰ Kweka and Fox (2011) report that 24 percent of households have a HE as a primary source of employment, and that another 42 percent of households have a HE as a secondary source of employment; Morisset and Haji (2014) identify small non-farm businesses as one of three key sources of job creation in Tanzania. HEs are arguably a major channel of structural change, in Tanzania and other SSA countries (Fox and Sohnesen, 2012).

¹¹ Recent data collected through surveys, interviews, and focus group discussions reveal that, on average, the lack of finance is perceived as representing the main challenge (Sánchez Puerta et al., 2018). Other challenges include weak markets, inadequate infrastructure, and, to a lesser extent, lack of skilled labor.

¹² The survey gathered data from 7,400 households in Tanzania and included a specific section on non-farm household enterprises useful to create a profile of HEs and identify their constraints.

reimburse, perhaps by making a greater effort at generating income. On the other hand, however, relatives may also be more forgiving than banks, and this may reduce the borrower's effort to reimburse. On balance, it is ultimately an empirical question whether individuals are better at reimbursing loans to relatives than to banks. Knowledge about this would help evaluate the full set of benefits and costs of promoting formal credit markets. It would thus be relevant for policy design.

Second, do individuals who expect that some neighbor, friend, or relative, may be in need of credit in the future, save more in order to be able to meet this need, or less in order to avoid having to lend? Answers to this question would shed light on whether this type of informal credit enhances or reduces aggregate savings, compared to a situation where individuals would save only to meet own future needs.

Third, does the participation in networks of friends, neighbors, and relatives, in which borrowing and lending takes place, affect an individual's occupational choice?

In particular, does it affect the allocation of time between farming and non-farming activities? Since these activities may imply different levels and kinds of risk, intuition suggests that there may be a link. Of particular relevance is the question of whether resorting to informal borrowing and lending induces a different time allocation than would resorting to formal, and thus impersonal, credit and savings channels.

Fourth, does the high prevalence of informal credit from networks of relatives, friends, and neighbors imply that HE owners feel the pressure to conduct business and/or given discounts within these networks? If so, what does this imply for the economic viability of such HEs?

There is a clear need for more data on how formal and informal credit impact productive behaviors (e.g., productive efforts, investment decisions, hiring decisions, and more generally the entrepreneurial process). The preceding discussion highlights an immense gap in the economics literature. So far, the literature on informal transfers (summarized in the previous section) has focused primarily on the role that these transfers play in *sharing risk*, and the idea that these transfers are sometimes perceived as a "kin tax". Yet informal transfers seem also to be a key source of *informal credit*. More research on how productive behaviors are affected by *borrowing and lending* between relatives, friends, and neighbors, as opposed to borrowing from formal financial institutions, is thus needed. While such research needs to clarify some theoretical issues, ultimately it is necessary to examine whether large effects appear in the data. In particular, it would seem important to understand whether individuals tend to distort their productive behaviors, thereby underexploiting economic opportunities, when resorting to credit from relatives, friends, and neighbors.

HEs in Tanzania: Missing ROSCAs?

Rotating Savings and Credit Associations (ROSCAs) are believed to provide an efficient way for individuals to save in order to invest in small businesses. ROSCAs are informal groups in which individuals contribute a certain amount on a regular basis and the sum thus collected is handed to one of the participants. In the academic literature they represent one of the most well-known informal savings arrangements to fund business creation (see the summary of the theoretical literature in Appendix F).

ROSCAs are believed to make it possible for individuals who do not have access to the formal banking sector to save amounts of money large enough for business investments. As is well known, a ROSCA allows all but one of

its participants to get access to the total amount of money (s) he contributes over the cycle of the ROSCA, before (s)he has contributed the full amount.

ROSCAs are believed to entail many other benefits, too. The community involved in any given ROSCA may also be a valuable source of information (for example about prices, business practices, or administrative rules), of social support, and of informal insurance for its members.¹³ Some of the respondents' answers in the study of Sánchez Puerta et al. (2018) confirm that ROSCAs indeed are perceived as delivering these benefits.¹⁴ Furthermore, ROSCAs may serve as a commitment device for individuals who suffer from a limited ability to commit to saving; indeed, the fact that the ROSCA

¹³ For example, see Udry (1990), Bouman (1995), and Fafchamps (2011).

¹⁴ Businesses, including HEs, benefit from information pertaining to market conditions, prices, suppliers, and regulation. While this suggests that the information benefit of ROSCAs to HE owners may be maximal if all the participants are active in the same branch, it is not clear whether competitors would be willing to share information with each other.

meets on a regular basis helps mitigate procrastination in savings behaviors.¹⁵

In spite of these potential benefits, only a small minority of HE owners in Tanzania participate in ROSCAs. According to the data collected by Sánchez Puerta et al. (2018), only a minority of HE owners participate in ROSCAs: around 17 percent of respondents declared that they have participated in credit and savings groups and 10 percent declared that they have participated in savings groups only. Instead, as noted above, more than 80 percent of their borrowed money comes from informal sources, of which half comes from friends and neighbors, and a quarter from relatives.

The rates of participation in ROSCAs are at odds with how HE owners in Tanzania perceive ROSCAs. According to Sánchez Puerta et al. (2018), around 80 percent of all the respondents, including those who do not currently participate in ROSCAs, believe that savings groups have or could have a positive impact on their businesses. These observations lead to the following questions: is it possible to build on the current functioning of ROSCAs in order to enhance their ability to channel informal credit, both at the intensive and at the extensive margin? And what explains the fact that individuals in Tanzania resort more to borrowing and lending through relatives, friends, and neighbors, rather than through ROSCAs?.

On top of its ability to improve access to funds for investment, ROSCAs are also believed to mitigate certain behavioral problems. ROSCAs may have untapped potential when it comes to responding to certain “behavioral” issues (Datta and Mullainathan, 2014). One such issue is *trust*, a factor which is key for economic development (Algan and Cahuc, 2014). Another potentially important issue is *aspiration* (Ray, 2006, Genicot and Ray, 2017).

Can ROSCAs be instrumental when it comes to enhancing trust and aspiration? In particular, is it possible to identify ways in which the widespread access to mobile phones in Tanzania may be used to improve ROSCA design? For example, can a system whereby individuals may rate each other’s

overall contribution to the ROSCA help alleviate trust issues? And, by extension, can this increase ROSCA participation (by spreading adequate and trustworthy information)? Indeed, as indicated above, there appears to be a gap between individuals’ perception of the impact of ROSCAs on HEs, and the rate of participation in such ROSCAs. Among the respondents in the study by Sánchez Puerta et al. (2018), the main reasons cited for not participating in ROSCAs include the fear of not being able to contribute on a regular basis, the belief that the poor are not accepted into ROSCAs, lack of information, and lack of trust. Hence, there is some reason to believe that some ROSCAs are “missing” due to a lack of adequate conditions. Websites and/or mobile phone apps that allow individuals to sign up for ROSCAs online (like *matontine* in Francophone Africa) may be a valuable tool to overcome some of these issues.

Further empirical research may help identify ways in which the current ROSCA formation processes in Tanzania may be improved. To sum up the preceding paragraphs, there appears to be a serious mismatch between, on the one hand, the actual rates of participation by HE owners in Tanzania in ROSCAs, and on the other hand, the large number of benefits thought to be entailed by ROSCAs as well as the perception by HE owners in Tanzania that ROSCA participation would be beneficial. This mismatch strongly suggests that more data should be collected on why HE owners choose not to participate in ROSCAs. In particular, is this choice related to the fact that HE owners typically obtain credit from relatives, friends, and neighbors? In other words, are HE owners reluctant to modify their behavior with respect to their social networks by instead turning to ROSCAs? If so, can the size of the economic consequences of this reluctance be estimated? Some research conducted by academics in other countries may be relevant for such empirical analysis of the current ROSCA formation processing in Tanzania; in particular, Angelucci et al. (2009) and Attanasio et al. (2012) study the formation of risk-sharing groups in Mexico and Colombia, respectively, while Banerjee et al. (2013) examine the diffusion of information about microfinance in social networks in India.

Concluding remarks

The preceding sections have put forward some evidence regarding the prevalence of household enterprises in

Tanzania and the funding thereof, as well as a summary of recent advances in economics that appears to be highly

¹⁵ See Ambec and Treich (2006).

relevant for developing economies. Taken together, this material leads to the conclusion that individuals' occupational choices, sources of funding, and savings decisions, are likely the result of a set of complex economic and social factors. The importance of these factors is expected to be particularly true in developing countries, where formal employment and access to formal credit is still the rule rather than the exception, and where informal networks instead dominate life. Hence, it is argued that policy-makers might in general benefit from research that seeks to improve our understanding of the interactions between economic and social factors.

In particular, it would be useful to empirically estimate the extent to which there are "missing ROSCAs" in Tanzania. Besides quantitative analyses, normative ones are also called for. Such analyses could compare the implications of switching HE funding from its current main source, i.e., relatives, friends, and neighbors, to ROSCAs. Would such a switch entail an increase in productive efforts, in savings, and in the way in which individuals allocate their time between agricultural activities and HEs? Would it enable individuals to develop a greater sense of trust in individuals outside of their traditional networks? Answers to these questions are necessary to develop a constructive discussion about the improvements that modifications to the design of ROSCAs or the technology used to implement ROSCAs, might bring about.

Finally, while ROSCAs have caught the attention of many economists, they are certainly not the only semi-formal financial institutions (Bouman, 1995). In particular, the closely related but nonetheless qualitatively distinct Accumulated Savings and Credit Associations (ASCRA) may merit more attention, especially in light of the evidence that it may be difficult for households to ensure adequate forms of savings (Dupas and Robinson, 2013). The ASCRA operates in a similar way to ROSCAs (i.e., members contribute to a common pool). However, instead of distributing the pot to one member at each meeting, the savings are accumulated, and members may request loans from the pot. Contributions plus interest plus fines make up the pool of funds available. An advantage of the ASCRA over the ROSCA is that it is more flexible: it typically does not require that individuals contribute on a regular basis, it can accommodate a more heterogeneous set of members, and it is typically larger. Furthermore, according to Bouman (1995), formalized ASCRAs can help people "extricate themselves from the oppressive influence of traditional village elders" (p 377). A disadvantage is that ASCRAs have higher overhead costs than ROSCAs, due to the paperwork that it entails. In a similar vein, and as already mentioned, modifications to micro-credit institutions, such as Savings and Credit Cooperative Organizations (SACCOs), may turn out to be fruitful (Maitra et al., 2017).





APPENDIX A

Measuring Structural Transformation



Definitions

The term “structural transformation” is used extensively in the literature but definitions and measurements adopted often differ. The most commonly used definition refers to the reallocation of economic activity across three broad sectors (agriculture, manufacturing, and services) that accompanies the process of economic development. Three indicators are largely used to measure changes in economic activity at the sectoral level: shares of (a) employment, (b) value added, and (c) final consumption expenditure. This study focuses primarily on employment shares as the indicator of structural transformation for two reasons. First, structural transformation is the main transition channel between growth and poverty reduction in contexts characterized by high employment-to-population ratios. Second, the employment measure of structural transformation is increasingly seen as preferable to those based on shares in value added and consumption expenditure because it does not suffer from the difficulty of separating out changes in quantities from changes in prices. This approach finds its roots in models of economic development that understand changes in the allocation of labor across sectors as key to economic development (for example, Harris and Todaro (1970) and Lewis (1954)). The assumption is that a surplus of agricultural labor characterizes most developing countries and movements of labor out of agriculture into higher-productivity sectors are the main driver of growth due to increases in overall labor productivity.

After defining structural change as changes in sectoral employment shares, the next important question concerns the definition of sector. The concept of structural transformation can be applied to different levels of disaggregation. This analysis will primarily look at structural transformation across broad economic sectors, namely agriculture, industry, and services, although additional breakdowns by detailed sectoral categories and by activity will be discussed.

Next, what does theory imply for cross-sector productivity gaps? Following Gollin, Lagakos and Waugh (2014), the neoclassical two-sector model envisages a Cobb-Douglas production function in agriculture and in non-agricultural sectors, assumes free labor mobility across sectors, and competitive labor markets. The production functions can be characterized as follow:

$$Y_a = A_a L_a^\theta K_a^{1-\theta} \quad \text{and} \quad Y_n = A_n L_n^\theta K_n^{1-\theta}$$

where θ indicates the labor share in production in each sector, a and n indicates agriculture and nonagricultural sectors,

and the variables Y, L, and K denote output, labor input, and capital input. Free labor mobility implies that in equilibrium wage should be equalized across sectors. The assumption of competitive labor markets implies that workers are paid the value of their marginal product and firms hire up to the point where the marginal product of labor equal the wage. Therefore, marginal value products are also equalized. It is then possible to derive the ratio of output per worker in non-agricultural sectors to that in agriculture as:

$$\frac{\frac{Y_n}{L_n}}{\frac{Y_a}{L_a}} = 1$$

In case this condition is not met, labor is misallocated relative to the competitive model. For example, if the value of the ratio is above 1, then productivity in non-agricultural sectors is higher than in agriculture and this would be an incentive for workers to move from agriculture to non-agricultural sectors. The process is expected to continue until the products are about the same in the two sectors. It is important to note that this condition does not depend on any assumption about other factors markets. If the condition does not hold, the explanation could be in measurement issues related to labor inputs (or value added) or some frictions that prevent the labor market from clearing. Assuming for now that the labor market is perfectly competitive, the first part of the study will focus on potential measurement problems in labor inputs or value added. Total labor inputs can vary along the extensive (participation in each sector) and intensive margin (conditional on participation, number of working hours in each sector). Therefore, following McCullough (2017), the productivity gap in output per worker between non-agricultural sectors and agriculture can be decomposed into a gap in productivity per hour worked (PGAP) and a gap in employment levels (EGAP):

$$GAP = \frac{\frac{Y_n}{L_n}}{\frac{Y_a}{L_a}} = \frac{\frac{Y_n}{L_n} * \frac{H_n}{H_n}}{\frac{Y_a}{L_a} * \frac{H_a}{H_a}} = PGAP * EGAP$$

where L_n denotes the number of workers in non-agricultural sectors and H_n refers to the total annual hours worked by a worker in non-agricultural sectors. Therefore, the presence of large gaps in productivity per worker across sectors might not necessarily be a sign of labor misallocation,

but rather of sizable differences in total labor inputs, as measured by working hours, provided to each sector. This has important implications in terms of possible drivers of labor movements across sectors. In presence of differences in working hours across sectors with comparable hourly returns to labor, the driving force of labor reallocation might lie in the search for full employment rather than for higher returns per hour.

Data sources

To examine productivity gaps, labor productivity measures and other key variables are constructed using micro data from three rounds of the Tanzania National Panel Survey (2010/11 or NPS2, 2012/13 or NPS3, and 2014/15 or NPS4).¹ NPSs are Living Standard Measurement Surveys – Integrated Surveys in Agriculture (LSMS-ISA), collected by the National Bureau of Statistics with technical support from the World Bank. The surveys collect information on a wide range of topics including agricultural production, non-farm income generating activities, consumption expenditures, and a wealth of other socioeconomic characteristics.

NPS data are used to derive two variables that are key to measurement of productivity gaps across sectors. First, one needs to construct total output by sector as captured by total labor income. Second, labor supply is measured along both the extensive and intensive margin, i.e. in terms of number of workers participating to each sector and number of working hours supplied to each sector in all jobs. Tanzania NPSs' questionnaires allow to identify workers, working hours, and labor income for both wage workers and non-wage workers, including own-account workers and contributing family workers that help out in the family business and/or on the household-operated farm.

Starting with output, labor income is composed of two main items: (i) wages and (ii) and profits of household-operated farms and/or non-agricultural household enterprises.

Typically, productivity gaps are measured using value-added from national accounts. This study will focus primarily on measures based on micro-data, whereby the output is measured in terms of total labor income, thus excluding returns to capital which are instead captured in indicators that use value-added measures from national accounts.

The first comprises gross total wages earned by wage workers, including in-kind payments and gratuities. The second group includes returns to operating a non-agricultural business that are measured using reported enterprise profits since they are considered more reliable relative to measures constructed as reported gross revenues minus costs.² In addition, there are profits from family farms that are based on net revenues and are constructed by the Rural Income Generating Activities (RIGA) project and include the value of auto-consumed farm output.³ All nominal values are adjusted for cost-of-living differences by using temporal and spatial price adjustments within rounds. All values are then deflated to 2015 prices using Consumer Price Index (CPI) data from the World Development Indicators.

The second key data input is a measure of labor supply. NPSs capture individuals' employment by using both a 7-day and 12-month recall period. However, the structure of the questionnaire changes over time, thus making comparability across rounds challenging to some extent. The most important change between NPS2 on the one hand and NPS3 and NPS4 on the other hand lies in the employment roster, which captures information about individuals' labor market participation. NPS3 and NPS4 questionnaires include an extended battery of questions aimed at capturing all types of work carried out by respondents over the last 12 months as well as over the last 7 days and to identify main and secondary activity in each case.

¹ NPS1 is not used in this study due to important changes in the survey instrument relative to following rounds, which might compromise the interpretation of patterns observed over time. NPS1, for example, only elicits information about the main wage job, whereas the three following rounds allow workers to report their secondary wage activity. Based on the last 3 rounds, between 5 and 8 percent of workers aged 15+ reported to have a second wage job. Although this is apparently not a major restriction, it could affect the pace of structural change estimated by comparing NPS1 with other rounds.

Precisely, the main fieldwork of the second round of the NPS started in October 2010 and finished in September 2011, with specialized tracking teams remaining in the field until November 2011. Similarly, the duration and timing of the field work for the third round of NPS was from October 2012 to November 2013. Field work for the fourth round started in October 2014 and lasted until January 2016.

² Whenever, profits are not reported, they are substituted by gross revenues minus costs instead of losing information about the enterprise and its labor.

³ Income from fishing is not accounted for in the calculation of total income since the way the survey captures fishing production change significantly over time, with separate dedicated modules in NPS3 and NPS4 only. Also, income from livestock activities is excluded from household total income as the corresponding labor inputs information is not captured as precisely as it is done for other activities. Livestock income corresponds to about 7/10 percent of total household income.

Despite efforts to improve comparability across survey rounds, such changes have sizeable implications in terms of overall employment and secondary jobs number. First, the employed population aged 15 and above increases from about 20.2 million in 2010/11 to 21.8 million in 2012/13 and 22.3 million in 2014/15. This implies a jump in the employment-to-population ratio between 2010/11 and 2012/13 as opposed to what is estimated for the following period. The employment-to-population ratio goes from 79 percent in 2010/11 up to 83.9 percent in 2012/13 (+4.9 percentage points) and 85.4 percent in 2014/15 (+1.5 percentage points with respect to the 2012/13 estimate) (Table A.1). Second, the pattern of secondary jobs is quite remarkable and likely to be a statistical artifact. Since information on labor supply will not be restricted to primary sector of employment, correctly estimating the number of secondary jobs is extremely important. The number of secondary jobs booms between the second and the third round from about 1.9 million (or 7 percent of all jobs) in 2010/11 to 4.2 million (or 14 percent of all jobs) in 2012/13 and 4.9 million (or 16 percent of all jobs) in 2014/15 (Table A.1).⁴ Such humongous increase in the share of secondary jobs has a large impact of the sectoral distribution of employment in secondary jobs: the share of agricultural secondary jobs declines from over 50 percent in 2010/11 to 36 percent in 2012/13 when commerce explodes and reaches 32 percent compared with 8 percent 2 years earlier.

In addition, patterns of missing values in annual working hours and earnings variables show considerable variation over time. In particular, the number of observations

TABLE A.1: Number of Primary and Secondary Jobs by Survey Round (employed population aged 15+)

	PRIMARY JOBS	SECONDARY JOBS	ALL JOBS	SHARE SECONDARY JOBS
2011	20,246,261	1,914,745	27,535,654	9.5%
2013	21,812,977	4,219,831	30,205,567	19.3%
2015	22,358,815	4,949,037	31,124,911	22.1%

Source: Tanzania National Bureau of Statistics.

with missing hours is about 19.6 percent of the sampled individuals aged 15+, categorized as employed, in 2010/11, 3.6 percent in 2012/13, and 7.4 percent in 2014/15. Those with missing earnings decline from about 17.8 percent in 2010/11 to 11 percent in 2014/15. Patterns are quite different by whether the activity is a primary or secondary job and whether it is a wage or a non-wage job. The share of missing hours is quite high in 2010/11 for both primary and secondary jobs in non-agricultural household enterprises. Missing values for both hours and earnings are particularly high for secondary jobs. In the case of hours, the share of secondary jobs observations with missing values is about 36 percent in 2010/11, 13 percent in 2012/13 and 21 percent in 2014/15. In the case of earnings, the share is higher and declining from 45 to 25 percent between 2010/11 and 2014/15 (Table A.2).

Because of the issues described so far and in order to avoid interpreting changes estimated over time as structural changes of the economy rather than a mere statistical artifact, the analysis of labor input, measured in terms of number of workers and number of working hours across all jobs, as well as of productivity gaps will be restricted to the last survey round. Yet, the first part of the analysis will illustrate patterns of structural transformation exploiting information from all the last three NPS rounds.

Labor supply variables and labor income will then be used to construct measures of average labor productivity at sectoral level and on a per-worker and per-hour basis.

TABLE A.2: Number of Primary and Secondary Jobs by Survey Round (employed population aged 15+)

	MISSING HOURS		MISSING EARNINGS	
	PRIMARY JOB	SECONDARY JOB	PRIMARY JOB	SECONDARY JOB
2011	18.0	36.0	15.2	44.9
2013	1.9	13.2	12.3	30.6
2015	4.7	21.2	8.2	24.7

Source: Tanzania National Bureau of Statistics.

Measuring labor supply

In order to measure labor supply in terms of number of workers and total number of hours worked by each individual in primary and secondary jobs, one needs to first identify the employed population and then assign

to each worker the number of hours worked in their primary and secondary job. Starting with employment, NPSs capture individuals' employment by using both a 7-day and 12-month recall period. However, the structure of the

⁴ In 2015, when the reference population is restricted to 25+ about 20 percent of workers have a secondary job.

questionnaire changed over time, thus making comparability across rounds challenging to some extent. The most important change between NPS2 on the one hand and NPS3 and NPS4 on the other hand lies in the employment roster, which captures information about individuals' labor market participation. NPS3 and NPS4 questionnaires include an extended battery of questions aimed at capturing all types of work carried out by respondents over the last 12 months as well as over the last 7 days and to identify main and secondary activity in each case. In NPS2, the main question reads as follows: "Did you do any work of any type for pay, profit, barter or home use during the last 7 days?". In NPS3 and NPS4 instead, employed is captured by a set of different questions, one for each specific activity and including wage job, non-farm family business and help therein, family farm and help therein, and unpaid apprenticeships. Such questions are asked first with reference to a 12-month recall period and then to a 7-day recall period. In addition, in NPS3 and NPS4, respondents classified as employed are allowed to list upfront the type of employment (wage work, own account work, contributing family work, unpaid apprenticeship) they were engaged in during the last 7 days and 12 months in both their primary and secondary activity. This possibility was precluded to respondents in the first two rounds.

Moreover, NPS2 allows household members to list a maximum of 2 non-farm enterprises per household, NPS3 and NPS4 do not limit the number of enterprises each household can report. For the sake of comparability over time, in NPS3 and NPS4 the number of non-farm enterprises considered in the analysis is restricted to the first two NFE listed by each household. This is not a major departure from what is observed in the data as less than 5 percent of sampled households that run non-farm enterprises report more than two enterprises and the share of household income derived from these additional enterprises is negligible. In NPS3 and NPS4, for each non-farm enterprise, the person responsible of the business is requested to list up to 6 household members working therein, whereas in NPS2 this information is not collected. For the sake of comparability, all individuals who report to be own-account workers in the employment roster are matched with the identifier of the person in charge of the non-agricultural business in the NFE module. In addition, all individuals reporting to be non-agricultural contributing family workers in the employment roster are assigned to the household main non-agricultural enterprise.

Individual annualized labor supply measures are constructed for wage, own-account, and contributing family workers. Wage labor supply is generated with reference to a 12-month period using reported number of months worked over the years preceding the interview, typical number of weeks worked per month, and usual number of hours worked per week. Information about number of months and weeks worked is not available for secondary wage jobs in NPS4, so median values from NPS3 are used instead. In the case of non-agricultural own account and contributing family work, the number of annual working hours is calculated for all individuals, whose employment roster and NFE module information is matched, by multiplying the number of months the business has been in operation over the past year times the total number of working weeks in a month (4.33) and the number of hours worked last 12 months (or last 7 days if the first is missing) in the NFE from the employment module. In the detailed agricultural module, information about labor participation and typical daily hours worked on the family farm is collected for each plot and separately for the long and short rainy season (the latter only in NPS3 and NPS4). Agricultural labor inputs are then aggregated at individual level assuming agricultural workers worked every day of the long and short season an average of 10 working hours per day in order to generate the total number of annual hours worked on the farm. NPS2 does not collect information regarding typical daily working hours on household farm in the agricultural model. For the sake of comparability, number of weekly working hours on the household farm is estimated in NPS3 and NPS4 and used to construct annual working hours in all rounds. In NPS3 and NPS4, the median number of working hours spent in a typical working day on the all crop-related activities is 10. As some workers report to be farm workers in the employment roster and are not found in the agricultural module, their annual number of working hours on the farm has been imputed using a set of non-missing average values estimated in the following order: (i) mean value of annual working hours estimated by gender and age group and primary job within the household; (ii) if still missing, mean value of annual working hours estimated by gender, age group, primary job, and region interacted with urban dummy; (iii) if still missing, mean value of annual working hours estimated by gender, age group, and region interacted with urban dummy.

Occupational Choices

Methodology

The alternative-specific logistic model is used to model the probability that an individual chooses one of several unordered alternatives for sector of work. This model can incorporate case-specific variables such as age and educational attainment as well as attributes that vary by the alternative – in this case, projected income – in order to model a discrete choice.

For the alternative-specific mixed logit model, the utility that individual i receives from alternative a , denoted by U_{ia} , is

$$U_{ia} = x_{ia}\beta_i + w_{ia}\alpha + z_i\delta_a + \epsilon_{ia} \quad a = 1, \dots, A$$

β_i are the set of random coefficients that vary over individuals in the population, and x_{ia} is the vector of the alternative-specific variable for predicted income. α are fixed coefficients on w_{ia} , a vector of the alternative-specific variable. δ are the alternative-specific coefficients on z_i , which is a vector of the case-specific variables. ϵ_{ia} is the random term. The probabilities of an individual selecting each discrete choice of sector are standard logistic probabilities integrated over the density $f(\beta)$.

The first stage of the model involves predicting incomes for each observation using case-specific individual and household characteristics based on the actual data of individuals working in each sector. These case-specific variables are drawn from the methodology used in McCullough (2015). Three models are generated with this strategy depending on the discrete choices of sector of employment for each individual – agriculture, industry, or services.

Predicted incomes in each sector are fed into the second stage of the model, which is the alternative-specific mixed logistic regression model described above, in order to determine the probability of choosing to work in each sector for each individual. The dependent variable of the second stage is a binary choice outcome for agriculture, industry, and services. The alternative-specific variable is the predicted income from the first stage of the regression and the case-specific variables are a vector of household and individual characteristics.

The base alternative in the model is the agricultural sector, to which all other results are compared. From this process, the individual probabilities for households can be computed in an unbiased and efficient way. Probabilistic outcomes are not guaranteed to map to observed choices of sector of employment, but rather provide a likelihood that an individual falls into one of the three categories based on their observed characteristics.

The average maximum probability of selecting any given sector is 0.665 with a standard deviation of 0.123.

To determine if the model is producing reasonable estimates, it is expected that the highest predicted sectoral outcome should match the observed result in approximately the same proportion as the average maximum probability computed above. This analysis shows that the model is assigning the correct occupation, that is the observed matches the predicted, in 76.5 percent of cases. For well distributed probabilities across the sectors, the model is effectively guessing at which occupation the household has.

TABLE A.3: Monthly Income by Sector, 2014, TZS

SECTOR	MEAN MONTHLY INCOME (NET)	MEDIAN MONTHLY INCOME (NET)	SD	N
Agriculture	66848.7	0	548921.6	32436
Industry	272672.3	172500	451550.9	6813
Services	313643.3	168000	591747.2	28758
Total	131981.8	28000	563816.9	68007

Source: Integrated Labor Survey 2014.

TABLE A.4: Productivity by Sector, 2014, TZS

SECTOR	MEAN PRODUCTIVITY (MONTHLY INCOME PER HOURS WORKED)	MEDIAN PRODUCTIVITY	SD	N
Agriculture	510.5	0	2912	32436
Industry	1472.8	808.6	3137	6813
Services	1516.5	735.2	3858.5	28758
Total	785.4	135	3189.4	68007

Source: Integrated Labor Survey 2014.

TABLE A.5: Summary Statistics of Household and Individual Characteristics by Sector, 2014

SECTOR	STATISTIC	TOTAL MONTHLY INCOME (NET)	COMPLETED PRIMARY	AGE	FEMALE	RURAL	ACCESS TO CREDIT	WEALTH INDEX	HH RECEIVED TRANSFER	EDU HH HEAD	FEMALE HH HEAD	HH DEPENDENCY RATIO	HH SIZE
Agriculture n=32436	mean	66848.7	0.8	31.7	0.5	0.8	0.0	0.1	0.1	2.6	0.2	0.5	6.1
	p50	0	-	28	-	-	-	0	-	3	-	0.5	6
Industry n=6813	mean	272672.3	1.0	34.9	0.3	0.2	0.0	0.2	0.1	3.1	0.2	0.3	5.1
	p50	172500	-	33	-	-	-	0.19	-	3	-	0.36	4
Services n=28758	mean	313643.3	1.0	35.3	0.5	0.2	0.1	0.2	0.2	3.3	0.3	0.4	4.6
	p50	168000	-	34	-	-	-	0.13	-	3	-	0.33	4
Total n=68007	mean	131,981.8	0.8	32.7	0.5	0.6	0.0	0.1	0.1	2.8	0.2	0.4	5.7
	p50	28,000	-	30	-	-	-	-	-	3	-	0.5	5

Source: Integrated Labor Survey 2014.

TABLE A.6: Alternative-Specific Mixed Logistic Regression for Sector Choice of Individuals

OCCUPATIONAL CHOICE OF HOUSEHOLD	COEFFICIENT	STANDARD ERROR	Z	P> Z	95% CONFIDENCE INTERVAL	
Agriculture					Base Alternative	
Industry						
Completed Primary Education	0.530	0.150	3.530	0.000	0.236	0.825
Age	-0.007	0.002	-2.910	0.004	-0.011	-0.002
Female	-0.869	0.072	-12.140	0.000	-1.009	-0.729
Rural	-1.794	0.097	-18.520	0.000	-1.984	-1.604
Access to Credit in Past 12 Months	1.283	0.211	6.090	0.000	0.870	1.696
Wealth Index	2.765	0.215	12.880	0.000	2.344	3.186
Household Received Transfers	-0.268	0.076	-3.530	0.000	-0.417	-0.119
Household Head Education	0.451	0.055	8.230	0.000	0.344	0.559
Household Female Head	0.315	0.079	3.980	0.000	0.160	0.470
Household Dependency Ratio	-1.047	0.140	-7.460	0.000	-1.322	-0.772
Household Size	-0.060	0.013	-4.640	0.000	-0.085	-0.034
[District Fixed Effects]						
Services						
Completed Primary Education	0.256	0.089	2.860	0.004	0.081	0.431
Age	-0.006	0.002	-3.030	0.002	-0.009	-0.002
Female	0.367	0.050	7.380	0.000	0.269	0.464
Rural	-2.090	0.060	-34.620	0.000	-2.208	-1.971
Access to Credit in Past 12 Months	2.143	0.169	12.680	0.000	1.812	2.474
Wealth Index	3.377	0.174	19.360	0.000	3.035	3.718
Household Received Transfers	-0.084	0.058	-1.440	0.150	-0.198	0.030
Household Head Education	0.691	0.050	13.830	0.000	0.593	0.789
Household Female Head	0.271	0.055	4.930	0.000	0.163	0.379
Household Dependency Ratio	-1.142	0.110	-10.420	0.000	-1.357	-0.928
Household Size	-0.048	0.012	-4.030	0.000	-0.072	-0.025
[District Fixed Effects]						

Source: Integrated Labor Survey 2014.

APPENDIX B

Data and Descriptive Statistics of the 2013 Enterprise Survey



The survey was administered to a representative sample of 813 firms in the non-agricultural formal private economy.

The universe of the survey is consistently defined and includes the entire manufacturing sector, the services sector, and the transportation and construction sector. Public utilities, government services, health care, and financial service sectors are not included in the universe. Besides firm’s characteristics such as location, year firms started operations, legal status, and sector of activities, the data encompasses detailed information on total labor cost, employment, intermediate inputs, obstacles to expansion, and production costs. The survey also reported the size of firms in 2010 and 2013 allowing the possibility to compute the net job creation as the difference of the two.

On average, firms in Tanzania were aged 13 years in 2013 and concentrated around 18 workers (Table B.1).

However, 50 percent of firms are less than 12 years old and have less than 8 workers, an indication of the high prevalence of micro and small firms. Labor cost including wages, bonuses and in-kind advantages to workers reaches on average 102.7 million TZS and the sales during a fiscal year 4,773.4 million TZS. Around 10 percent of the firms export their products and only three percent use technology license acquired from a foreign-owned company. Finally, two-third of firms are located in Dar es Salam.

The survey did not report the size and the age of some firms. Firms for which the size is unknown are excluded in the analysis of the number of employment. Firms are categorized in four groups: *micro* firms which employ 1-4 workers, *small* firms with 5-19 workers, *medium* firms with 20-99 workers, and *large* firms with 100 workers or more.

Overall, medium and large firms concentrate most jobs but represent few companies. Most firms are concentrated in micro and small groups. Large firms with 100 employees or more represent just 2 percent of the firms in Tanzania but account for 35 percent of employment. Moreover, firms with

TABLE B.1: Firm Descriptive Statistics, 2013

	MEAN	MEDIAN	OBSERVATIONS (#)
Age (year)	13.1	12	776
Size (# workers)	17.7	8	792
Labor cost (million TZ shilling)	102.7	8	334
Sales (million TZ shilling)	4,773.4	35	512
Exporter (dummy)	0.11		792
Use of High-technology (dummy)	0.03		792
Dar es Salam (dummy)	0.65		792

Source: Enterprise Survey 2013.

Note: Labor cost includes wages, bonuses and in-kind advantages to workers.

50 workers or more represent less than five percent of all firms (4.5 percent) but account for 43 percent of employment (Table B.2). Medium firms with 20 to 99 employees represent 18 percent of firms and 31 percent of employment. Therefore, firms with 20 workers or more represent 20 percent of all firms but account for around two thirds (66 percent) of employment. This leaves less than one third of employment to micro and small firms (firm with less than 20 employees) though they represent 80 percent of the firms in Tanzania.

Young firms of less than 5 years account for 14 of all firms and concentrate 9 percent of employment.

Firms in the age group of [5-9] years represent more than one quarter of all firms and concentrate 24 percent of employment. The age group of [10-19] concentrate most firms (41 percent) and most employment (36 percent). Firms of 20 years or more represent 17 percent of all firms, and account only for 31 percent of jobs.

The entry rate of firms between 2010 and 2013 is 3.5 percent representing the percentage of firms created within that period. In 2013, single-worker firms, meaning the self-employed, account for approximately 5 percent of all firms and only 0.3 percent of employment. Those self-employed firms have, on average, 11.6 years of existence and 15.3 percent of them are new firms that started operations after 2010. Two-worker firms exhibit almost the same pattern accounting for just 4.6 percent of all firms, concentrating 0.5 percent of employment, and averaging 11.6 years of existence but no new entry.

TABLE B.2: Firm Descriptive Statistics, 2013

Size category	FIRMS		EMPLOYMENT		AGE	ENTRY RATES
	# OF FIRMS	% OF FIRMS	# JOBS	% OF JOBS	YEARS	2011–2013
1	752	5.5	752	0.3	11.6	15.3
2	627	4.6	1,254	0.5	11.6	0.0
[3–4]	940	6.9	3,231	1.3	14.3	4.8
[5–9]	5,521	40.6	35,937	15.0	12.2	3.7
[10–19]	3,058	22.5	40,547	16.9	13.3	2.3
[20–49]	2,104	15.5	56,395	23.5	13.8	2.2
[50–99]	325	2.4	19,055	7.9	17.4	0.0
[>=100]	283	2.1	83,010	34.6	20.4	0.0
Total	13,610	100	240,182	100	13.1	3.5

Source: Enterprise Survey 2013.

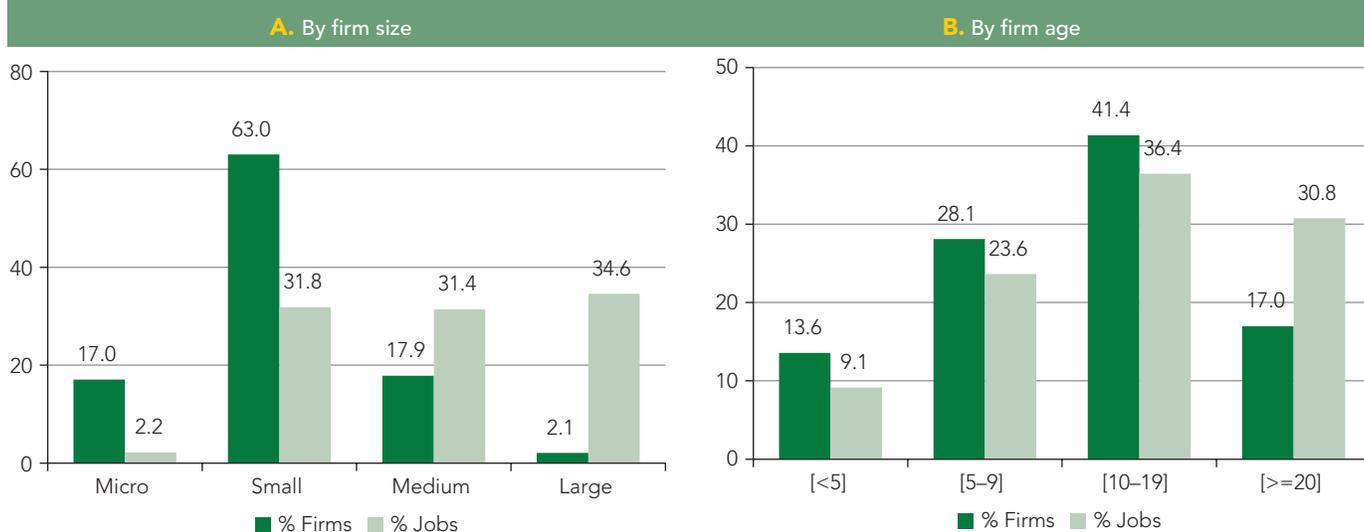
Note: The statistics presented in this table are based on the 2013 enterprises survey. For each firm, jobs are measured as the sum of all employment. The number in the fourth column presents the aggregate total by firm size category. Age is measured as the average age of firm in the size category. The age of a firm is the difference between 2013 and the year of startup. Entry rates are measured as the share of new firms created between 2011 and 2013 of the total number of firms that are operational in 2013.

Large firms (100+ employees) accounting for most jobs tend to be the oldest with 20.4 years of existence on average and no new entry.

Table B.3 below presents the distribution of employment by firm size and age in 2013. It documents that most jobs

are concentrated in relatively old large firms. Young micro and small firms concentrate fewer jobs. This is the general pattern also followed by medium firms where most of the jobs are concentrated in medium old firms. Apart from firms of one and two years, most jobs are concentrated in medium and large firms regardless of the age groups.

FIGURE B.1: Distribution of Firms and Jobs by Firms' Size and Age



Source: Enterprise Survey 2013.

Note: *Micro* firms employ 1-4 workers, *small* firms: 5-19, *medium* firms: 20-99, *large* firms: 100+.

TABLE B.3: Employment by Firm Size and Age, 2013

Age (years)	FIRM SIZE CATEGORY								TOTAL	SHARE
	1	2	[3-4]	[5-9]	[10-19]	[20-49]	[50-99]	[>=100]		
1	0	0	141	861	529	202	0	0	1,732	0.8
2	110	0	22	347	564	863	0	0	1,907	0.8
3	41	159	106	931	1,027	0	246	1,072	3,581	1.6
4	150	99	177	1,935	1,269	6,400	2,355	1,263	13,648	6.0
[5-9]	80	408	454	10,328	13,976	13,844	1,157	13,714	53,961	23.6
[10-14]	158	302	1,263	8,434	8,672	10,992	3,052	8,308	41,181	18.0
[15-19]	89	86	526	6,540	7,742	9,134	7,649	10,234	42,000	18.4
>=20	89	200	384	4,880	6,197	14,830	4,300	39,331	70,211	30.8
Total	717	1,254	3,074	34,257	39,975	56,265	18,758	73,922	228,221	100
Share	0.3	0.5	1.3	15.0	17.5	24.7	8.2	32.4	100	

Source: Enterprise Survey 2013.

APPENDIX C

Determinants of Job Creation



Methodology

The methodology to estimate job creation that uses employment level at the end year at the dependent variable induces the attendant biases. Davis et al. (1996) suggest using the average of the firm size between the start and the end year. Rijkers et al. (2014) state that this last methodology reduces the bias despite some limitations since firms that traverse size classes are counted as having originated in a size class that is an average of the starting and ending size class. The contribution of firms in size classes on either extreme of the size distribution is then likely to be underestimated. From Davis et al. (1996), aggregate measures of job creation and destruction can be generated at any level of aggregation by using appropriately employment weighted summations of firm-level employment growth, g_{ist} , that's the change in employment from year $t-1$ (2010 for this paper) to year t (2013 for this paper), divided by average size. For this paper, employment-weighted firm-level regressions of net employment growth is estimated using the approach by Rijkers et al. (2014).

$$g_{ist} = 2 \frac{E_{ist} - E_{ist-1}}{(E_{ist} + E_{ist-1})}$$

This is the dependent variable used in the regressions.

It is the Davis-Haltiwanger-Schuh growth rate in which E_{ist} denotes employment in firm i of types s at year t . The variable g_{ist} is symmetric bounded by -2 and 2. If a firm entered the market after 2010, $E_{ist-1}=0$ and $g_{ist}=2$. If a firm that existed in 2010 has disappeared in 2013, its size equals zero in 2013, $E_{ist}=0$, and $g_{ist}=-2$. Hence, g_{ist} accommodates both entry and exit (Rijkers et al., 2014). However, for entrant firms that started operations after 2010, we choose the start-up year as the $t-1$ year.

Results

Tables C.1 and C.2 present the results of regressions of net job creation on firm-size and age dummies.

Regressions have been executed for the year 2013, first for all firms and then for firms excluding new entrants – i.e., firms created between 2010 and 2013 (Table C.1). Omitted categories for firm size and firm age are respectively $size=1$ and $age=0$ or 1. The regression coefficients are then expressed relatively to these categories.

Rijkers et al. (2014) assess the extent of observed relationship between firm size and firm growth that is due to firm size per se or to firm characteristics by progressively considering elaborate sets of explanatory variables.

Inspired from Haltiwanger et al. (2013), they first include size and age dummies separately and subsequently jointly. In this paper, we follow the same approach where both size dummies based on year t and year $t-1$ are used to examine the impact of measurement error and the determinants of firm growth. Then, for 2010 and 2013, we investigate the impact of productivity (Y/L), and firm performance measured by two variables that are the utilization capacity of the firm and hours worked per week.

The general specification of the model takes the following form:

$$g_{ist} = \beta_s Size + \beta_A Age + \beta_p Productivity + \beta_{UC} (Utilization Capacity) + \beta_{hw} (Hours worked) + \beta_t \tau + \beta_l l + \epsilon_{it}$$

Where Size is the vector of size dummies, Age is the vector of age dummies, τ is the vector of time dummies, l is the vector of industry dummies, and Productivity, Utilization Capacity and Hours are variables representing those concepts. Time and industry are control variables. Data are subject to measurement errors especially when estimating the hours worked per week that may be affected by sporadic interruptions. Also, measurement of firm size can be affected by extreme values that induce another bias. To reduce those biases, we use the log of output per worker for productivity and rank for hours worked. Those strategies help minimizing the impact of potential measurement errors (Rijkers et al., 2014).

The size of firms has a positive impact on job creation.

Regression results of net job creation on firm size dummies reveals that job creation by firms of 3-4 workers is 27.6 percent higher than job creation by one-person firms. The coefficient estimates suggest that job creation is the highest among firm employing between 50 and 99 workers: the net job creation rate in these firms is around 52 percent higher than that for one-person firms.

TABLE C.1: Correlates of Job Creation 2010–2013 – Size and Age

	ALL FIRMS			WITHOUT NEW ENTRANTS		
	(1)	(2)	(3)	(4)	(5)	(6)
Firms' Size (omitted: 1 worker)						
2	0.131 (0.13)		0.131 (0.13)	0.172 (0.13)		0.172 (0.13)
[3–4]	0.276** (0.11)		0.276** (0.11)	0.318** (0.11)		0.318** (0.11)
[5–9]	0.299** (0.09)		0.299** (0.09)	0.343*** (0.10)		0.343*** (0.10)
[10–19]	0.402*** (0.10)		0.402*** (0.10)	0.444*** (0.10)		0.444*** (0.10)
[20–49]	0.299** (0.10)		0.299** (0.10)	0.341*** (0.10)		0.341*** (0.10)
[50–99]	0.518*** (0.11)		0.518*** (0.11)	0.558*** (0.11)		0.558*** (0.11)
[>=100]	0.418*** (0.11)		0.418*** (0.11)	0.457*** (0.11)		0.457*** (0.11)
Firms' Age (omitted: 1 year old / 3 years old without new entrants)						
2		-0.021 (0.23)	0.093 (0.23)			
3		-1.900*** (0.21)	-1.862*** (0.21)			
4		-1.792*** (0.20)	-1.775*** (0.19)	0.107 (0.14)	0.084 (0.13)	
[5–9]		-1.827*** (0.20)	-1.819*** (0.19)	0.073 (0.13)	0.040 (0.13)	
[10–14]		-1.748*** (0.20)	-1.775*** (0.19)	0.150 (0.13)	0.080 (0.13)	
[15–19]		-1.934*** (0.20)	-1.964*** (0.19)	-0.034 (0.13)	-0.108 (0.13)	
>=20		-1.933*** (0.48)	-2.022*** (0.48)	-0.034 (0.47)	-0.165 (0.46)	
Sector dummies	Yes	Yes	Yes			Yes
Year dummies	Yes	Yes	Yes			Yes
N	776	776	776	759	759	759
R ²	0.365	0.333	0.365	0.137	0.092	0.137

Note: * Significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level.

Age appears to significantly affect job creation capacities of firms in a negative way. Results suggest that older firms create less jobs. However, it reflects a statistical artefact stemming from the creation of the dependent variable (G_{ist}) for which firms created after 2010 were attributed a maximal value of 2. Removing new entrants as in models (4), (5), and

TABLE C.2: Correlates of Job Creation 2010–2013 – Productivity and Performance on All Firms

	(1)	(2)	(3)	(4)	(5)
Productivity	0.014 (0.01)		0.020 (0.01)		0.023 (0.02)
Utilization capacity		0.002 (0.00)		0.001 (0.00)	0.001 (0.00)
Rank of hours worked		-0.001 (0.00)		-0.001 (0.00)	-0.001 (0.00)
Firms' Size (omitted: 1 worker)					
2			0.353 (0.18)	0.279 (0.35)	0.000 (.)
[3–4]			0.497** (0.17)	0.406 (0.33)	0.216 (0.20)
[5–9]			0.438** (0.15)	0.240 (0.32)	0.036 (0.16)
[10–19]			0.557*** (0.15)	0.305 (0.33)	0.094 (0.19)
[20–49]			0.484** (0.15)	0.282 (0.32)	0.143 (0.18)
[50–99]			0.687*** (0.16)	0.546 (0.33)	0.391* (0.18)
[>=100]			0.541*** (0.16)	0.419 (0.33)	0.214 (0.19)
Firms' Age (omitted: 1 year old)					
2			-0.058 (0.49)	0.000 (.)	0.000 (.)
3			-1.867*** (0.44)	-1.946*** (0.49)	-2.106*** (0.51)
4			-1.860*** (0.44)	-1.676*** (0.43)	-1.662*** (0.44)
[5–9]			-1.751*** (0.44)	-1.985*** (0.41)	-1.820*** (0.41)
[10–14]			-1.917*** (0.44)	-1.966*** (0.39)	-1.889*** (0.38)
[15–19]			-2.008*** (0.43)	-1.917*** (0.39)	-1.821*** (0.38)
>=20			-2.167*** (0.61)	-1.994*** (0.54)	-2.024*** (0.52)
Sector dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
N	507	250	507	250	204
R ²	0.242	0.394	0.281	0.431	0.501

Note: * Significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level.

(6) removes the statistical artefact as well as the significance of age.

The results are not sensitive to the cut-offs of firms' size.

When considering large firms as those with 50 employees or more, and medium firms as those with 20 to 49 employees,

results did not change. Change in the cut-offs increases the weight of large firms.

The second regression model (Table C.2) attempts to determine whether variables such as firms' productivity and performance have an impact on firms' growth and job creation. The performance of firms is measured with two variables namely (i) the utilization capacity and (ii) the number of hours worked.

To minimize the impact of measurement error and mis-reporting, productivity is measured as the log of output per worker, and hours worked is replaced by its rank following Rijkers et al. 2014. These latter draw attention on potential endogeneity of the productivity and performance variables and suggest interpreting the regression coefficients as conditional correlations rather than causal relationships.

Results from (1) and (2) show that firm productivity as well as their performance in 2013 do not influence job growth. Controlling the regression on firms' productivity for firms' size and age, size appear to have some significant positive impact on firm growth, while firms' age seems to be significantly negatively correlated with firm's growth – albeit reflecting a statistical artefact (See discussion above).

The third regression model (Table C.3) attempts to determine whether firms in some sectors of activities are more dynamics than those in other sectors. Firms have been grouped in four sectors: *Manufacturing* which includes all manufacturing firms; *Utilities & construction*; *Trade* that includes firms working wholesale, retail, and services of motor vehicles; and *Market services* that includes transport and hotels, restaurants and other accommodation, and IT. *Manufacturing* is taken as the omitted category.

Regressions, even after controlling for firm size, firm age and year dummies show that no particular sector is particularly dynamic.

TABLE C.3: Correlates of Job Creation 2010–2013 – Sector of Activity on All Firms

	(1)	(2)
Sector (omitted: Manufacturing)		
Utilities & construction	0.249 (0.15)	0.247 (0.15)
Trade	−0.004 (0.04)	0.015 (0.04)
Market services	0.003 (0.04)	0.009 (0.04)
Size (omitted: 1 worker)		
2		0.160 (0.12)
[3–4]		0.291** (0.11)
[5–9]		0.319*** (0.09)
[10–19]		0.418*** (0.10)
[20–49]		0.320*** (0.10)
[50–99]		0.538*** (0.11)
[>=100]		0.433*** (0.11)
Age (omitted: 1 year old)		
2		0.104 (0.23)
3		−1.871*** (0.21)
4		−1.767*** (0.19)
[5–9]		−1.824*** (0.19)
[10–14]		−1.778*** (0.19)
[15–19]		−1.961*** (0.19)
>=20		−2.093*** (0.48)
Sector dummies	No	No
Year dummies	Yes	Yes
N	776	776
R ²	0.326	0.358

Note: * Significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level.

APPENDIX D

Determinants of Financial Inclusion



The analysis of the determinants of financial inclusion in Tanzania relies on the paper of Zins and Weill (2016) and uses the 2017 World Bank’s Global Findex database. The database is obtained from surveys realized in 143 countries and covering almost 150,000 persons worldwide. It provides a large number of indicators on financial inclusion enabling to assess the amount of account penetration, the use of financial services, the purposes and motivations, the alternatives to formal finance, etc. It also provides micro-level information – gender, age, income and education – that is used in our estimations. The sample

is restricted to Tanzania and contains 1,008 individuals, of which 507 are women and 501 are men.

Following Zins and Weill, the analysis uses probit models to examine the factors influencing financial inclusion, including formal finance, mobile money banking and informal finance. More specifically, it explores the impact of individuals’ socio-economic and demographic characteristics – gender, age, income, education, employment, geographic location – on financial inclusion. Financial inclusion is measured using three main indicators: formal account, formal saving and formal credit.

Financial inclusion Indicators: Dependent variables

- *Formal account* refers to the fact that the individual has an account either at a financial institution or through a mobile money provider.
- *Formal saving* refers to the fact that the individual saved using an account at a financial institution in the past 12 months.

- *Formal credit* refers to the fact that the individual borrowed from a financial institution in the past 12 months.

All these variables are dummies equal to one if the person responded “yes” and zero otherwise.

Determinants of financial inclusion: Explanatory variables

Explanatory variables include the individual characteristics: Gender is a dummy variable equal to one if the individual is woman (Female) and zero else. Age is represented with the number of years (*Age*) and its squared (*Age2*) in order to control for a possible nonlinear relation between age and financial inclusion. Four dummy variables are used to take income into household income quintile (poorest 20%, second 20%, third 20%, fourth 20% and richest 20%). Each quintile is a dummy variable equal to one if the individual/household is in this income quintile, zero otherwise. The fifth richest quintile is

the omitted dummy variable. Two dummy variables are used for education: Secondary education, equal to one if the individual has completed secondary education, and Tertiary education, equal to one if the individual has completed tertiary education or more. The omitted dummy variable is primary school or less.

Table D.1 shows the results and the marginal effects of the probit estimations for the main indicators of financial inclusion. Tables D.2 to D.5 further examine the effect of individual characteristics on saving and credit behavior.

TABLE D.1: Determinants of the main Financial Inclusion indicators

	FORMAL ACCOUNT	FORMAL SAVING	FORMAL CREDIT
Female	-0.181 (0.099)	0.105 (0.128)	0.074 (0.148)
Age	0.044** (0.017)	0.060* (0.024)	0.061** (0.022)
Age squared	-0.000* (0.000)	-0.001* (0.000)	-0.001* (0.000)
Income - poorest 20%	-0.957*** (0.168)	-0.795** (0.243)	-0.327 (0.244)
Income - second 20%	-0.835*** (0.156)	-0.732*** (0.222)	-0.800*** (0.223)
Income - third 20%	-0.591*** (0.148)	-0.893*** (0.192)	-0.182 (0.197)
Income - fourth 20%	-0.293 (0.150)	-0.423* (0.180)	-0.688** (0.220)
Secondary education	0.771*** (0.120)	0.862*** (0.150)	0.215 (0.162)
Tertiary education	1.765*** (0.496)	1.111*** (0.313)	0.645 (0.356)
Observations	1006	992	997
Pseudo R ²	0.136	0.182	0.076
Log likelihood	-584.585	-248.103	-223.273

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Source: Findex 2017.

TABLE D.2: Determinants of Saving (Formal and Informal)

	FORMAL SAVING	INFORMAL SAVING	SAVED ANY MONEY IN THE PAST 12 MONTHS
Female	0.105 (0.128)	0.167 (0.118)	-0.106 (0.101)
Age	0.060* (0.024)	0.066*** (0.016)	0.055** (0.014)
Age squared	-0.001* (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Income - poorest 20%	-0.795** (0.243)	0.139 (0.190)	-0.292 (0.165)
Income - second 20%	-0.732*** (0.222)	-0.181 (0.180)	-0.222 (0.163)
Income - third 20%	-0.893*** (0.192)	0.095 (0.172)	-0.014 (0.156)
Income - fourth 20%	-0.423* (0.180)	-0.223 (0.177)	-0.202 (0.155)
Secondary education	0.862*** (0.150)	-0.075 (0.140)	0.330* (0.122)
Tertiary education	1.111*** (0.313)	-0.217 (0.412)	1.018** (0.379)
Observations	992	997	1006
Pseudo R ²	0.182	0.045	0.042
Log likelihood	-248.103	-371.537	-651.708

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Source: Findex 2017.

TABLE D.3: Determinants of Saving Motivation

	FOR FARM OR BUSINESS	FOR OLD AGE	FOR EDUCATION
Female	-0.221* (0.101)	-0.056 (0.136)	0.011 (0.106)
Age	0.049** (0.015)	0.043* (0.019)	0.041** (0.015)
Age squared	-0.001** (0.000)	-0.000 (0.000)	-0.000* (0.000)
Income - poorest 20%	-0.671*** (0.167)	-0.525* (0.221)	-0.141 (0.168)
Income - second 20%	-0.319* (0.156)	-0.212 (0.212)	-0.180 (0.166)
Income - third 20%	-0.314* (0.145)	-0.331 (0.205)	0.049 (0.148)
Income - fourth 20%	-0.150 (0.144)	-0.309 (0.194)	0.058 (0.153)
Secondary education	0.197 (0.114)	0.662*** (0.159)	0.310** (0.119)
Tertiary education	0.876* (0.351)	1.706*** (0.325)	0.339 (0.326)
Observations	1004	997	1000
Pseudo R ²	0.058	0.123	0.025
Log likelihood	-599.405	-228.194	-526.741

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Source: Findex 2017.

TABLE D.4: Determinants of Loan-taking Motivation (Formal and Informal)

	FOR EDUCATION	FOR MEDICAL PURPOSES	FOR FARM OR BUSINESS	TO PURCHASE A HOME OR LAND
Female	0.017 (0.115)	-0.083 (0.101)	-0.236* (0.105)	0.211 (0.148)
Age	0.031 (0.017)	0.039** (0.015)	0.066*** (0.017)	0.032 (0.032)
Age squared	-0.000 (0.000)	-0.000* (0.000)	-0.001*** (0.000)	-0.000 (0.000)
Income - poorest 20%	0.243 (0.186)	0.709*** (0.160)	-0.531** (0.170)	-0.661** (0.251)
Income - second 20%	-0.217 (0.183)	0.042 (0.153)	-0.477** (0.162)	-0.711** (0.253)
Income - third 20%	0.014 (0.177)	0.254 (0.146)	-0.249 (0.152)	-0.601** (0.210)
Income - fourth 20%	-0.031 (0.181)	0.047 (0.154)	-0.351* (0.159)	-0.449 (0.309)
Secondary education	0.444*** (0.134)	0.222 (0.119)	0.009 (0.123)	0.584** (0.194)
Tertiary education	0.170 (0.397)	0.400 (0.364)	-0.214 (0.325)	1.287** (0.352)
Observations	1000	1000	1002	999
Pseudo R ²	0.028	0.041	0.052	0.130
Log likelihood	-448.187	-561.838	-505.868	-161.045

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Source: Findex 2017.

TABLE D.5: Determinants of Sources of Borrowing

	A STORE	FAMILY AND FRIENDS	ANOTHER PRIVATE LENDER	INFORMAL CREDIT	FORMAL CREDIT	ALL SOURCES
Female	-0.463 (0.382)	-0.133 (0.097)	0.016 (0.148)	-0.115 (0.097)	0.074 (0.148)	-0.029 (0.098)
Age	0.038 (0.042)	0.015 (0.014)	0.018 (0.023)	0.022 (0.014)	0.061** (0.022)	0.027 (0.014)
Age squared	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.001* (0.000)	-0.000* (0.000)
Income - poorest 20%	1.055* (0.504)	0.248 (0.156)	0.074 (0.225)	0.285 (0.155)	-0.327 (0.244)	0.234 (0.161)
Income - second 20%	0.593 (0.519)	0.198 (0.150)	-0.214 (0.214)	0.216 (0.150)	-0.800*** (0.223)	0.078 (0.154)
Income - third 20%	0.736 (0.469)	0.083 (0.143)	-0.440* (0.213)	0.040 (0.142)	-0.182 (0.197)	-0.016 (0.147)
Income - fourth 20%	0.716 (0.462)	-0.079 (0.143)	-0.038 (0.221)	-0.111 (0.142)	-0.688** (0.220)	-0.220 (0.146)
Secondary education	0.775** (0.242)	0.212 (0.113)	-0.002 (0.169)	0.249* (0.113)	0.215 (0.162)	0.325** (0.116)
Tertiary education	0.000 (.)	0.285 (0.332)	0.000 (.)	0.235 (0.332)	0.645 (0.356)	0.545 (0.316)
Observations	980	1003	979	1006	997	1006
Pseudo R ²	0.108	0.011	0.018	0.015	0.076	0.020
Log likelihood	-32.299	-667.047	-237.833	-673.824	-223.273	-677.711

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Source: Findex 2017.



APPENDIX E

Access to Finance and Tanzania's Firms Growth



We conduct an empirical investigation of the effects of access to finance on the growth of firms in Tanzania using data from the 2006 and 2013 Enterprise Surveys and following the econometric approach of Fowowe (2017). Following Fowowe, firm growth is calculated as the log difference between the current number of permanent employees and the number of permanent employees three years before the survey year, divided by the difference between the survey years:

$FG_{it} = [(\ln S_{it} - \ln S_{i,t-3})/3]$, where FG_{it} is firm growth and S_{it} is firm size, represented by permanent employment.

Enterprise surveys also contain data on sales of firms, but they were not considered as a measure of growth due to their high volatility and measurement biases. We employ both subjective and objective measures of access to finance as explanatory variables. The subjective measure of access to finance is obtained from the ranking of access to finance as no obstacle or severe obstacle to business operations. Although subjective measures offer useful insight into the severity of access to finance constraints and business environment obstacles, they represent firm perceptions of the business environment, which could reflect idiosyncratic differences in the degree of optimism or pessimism of the respondents. Answers could also be influenced by the experience and performance of the firm. To address these limitations and ensure the robustness of the results, objective measures are used in addition to subjective ones to examine how access to finance affects firm performance. The objective measure of access to finance is a variable which measures whether firms are constrained in obtaining credit or not.

Three objective measures were created: The first measure uses the definition of credit constrained status to construct four groups based on the extent to which firms were credit constrained during the fiscal year of survey. Following Fowowe, we create an ordinal variable Credit Constrained Status (CCS) for which: 1 = Full Credit Constrained (FCC), for firms that applied for a loan and were rejected and do not have any type of external finance; 2 = Partially Credit Constrained (PCC), which includes firms that applied for a loan and were rejected but that managed to find some other forms of external finance; 3 = Maybe Credit Constrained (MCC), for firms that have had access to external finance and there is evidence of them having bank finance; 4 = Non Credit Constrained (NCC), for firms that did not apply for a loan during the previous year because they have enough capital for the firm's needs. Thus, higher values of CCS denote higher values of access to finance. Objective measures include two additional variables: Creditline, which

is a dummy variable with a value of 1 if the firm has a loan or creditline, and 0 otherwise; the second is Overdraft, which is a dummy variable with a value of 1 if the firm has an overdraft facility and 0 otherwise.

Table E.1 presents mean values of the access to finance constraint and objective access to finance variables based on the 2013 Enterprise Survey. We observe interesting variability across firms based on their age and size. The access to finance constraint is lower among large firms. It is interesting to note that both subjective and objective measures suggest that larger firms (and to a lesser extent older ones) face less severe constraints in accessing finance than micro and small ones (and younger firms).

TABLE E.1: Access to Finance Constraint and Participation in Financial Market (mean)

	ACCESS TO FINANCE CONSTRAINT	CREDIT CONSTRAINED STATUS (CCS)	OVERDRAFT	CREDITLINE
Tanzania	3.20	2.31	0.06	0.15
Age				
<5 years	3.23	2.20	0.11	0.15
6 to 15 years	3.19	2.39	0.05	0.16
> 16 years	3.32	2.39	0.09	0.17
Size				
Micro	3.20	2.29	0.03	0.13
Small	3.24	2.31	0.10	0.18
Medium	3.33	2.71	0.20	0.35
Large	2.58	2.94	0.28	0.63

Source: Enterprise Survey 2013.

Note:

- Access to Finance Constraint is a subjective evaluation of the severity of obstacles that firms face in accessing finance on a scale of 1-5 (1 = no obstacle; 5 = very severe obstacle).
- Credit Constrained Status is an ordinal variable that ranges from 1 to 4 (1 = FCC, 2 = PCC, 3 = MCC, and 4 = NCC).
- Overdraft and Creditline are dummy variables (0 and 1).

The regression model controls for general business conditions, firm characteristics, and regional controls.

General business conditions are proxied by business regulatory conditions and corruption. Firms characteristics include information on size, age, and sector.

We estimate models where employment growth is the dependent variable and variables measuring access to finance constraints and participation in financial markets are the primary explanatory variables. Additional variables measuring business conditions, corruption, firm characteristics, and regional dummies are included as control variables. The models were estimated using the panel Enterprise survey for 2006 and 2013 and using the 2013 dataset only. However, the limited quality of the panel survey data undermined the robustness of the results. Estimation results using the 2013 dataset are summarized in Tables E.2 and E.3.

TABLE E.2: Effect of Access to Finance and Business Environment Constraints on Firms Growth, Subjective Measures, 2013

	NO CONTROLS	FIRM CONTROLS
Access to Finance (omitted: no obstacle)		
Minor obstacle	2.14** (1.12)	-2.09* (1.13)
Moderate obstacle	-2.8* (1.5)	-2.63* (1.5)
Major obstacle	-3.52*** (1.40)	-3.63*** (1.6)
Very severe obstacle	-1.6 (1.9)	-1.5 (1.9)
Electricity (omitted: no obstacle)		
Minor obstacle	1.00 (1.61)	1.13 (1.66)
Moderate obstacle	1.99 (1.50)	2.20 (1.60)
Major obstacle	0.34 (1.05)	0.44 (1.00)
Very severe obstacle	0.72 (1.20)	0.81 (1.05)
Telecommunications (omitted: no obstacle)		
Minor obstacle	-0.024 (0.29)	-0.072 (0.29)
Moderate obstacle	-0.13 (0.62)	-0.12 (0.56)
Major obstacle	0.017 (0.48)	-0.19 (0.49)
Very severe obstacle	-2.59 (1.74)	-2.62 (1.61)
Transportation (omitted: no obstacle)		
Minor obstacle	0.71 (0.49)	0.78 (0.53)
Moderate obstacle	0.23 (0.38)	0.37 (0.46)
Major obstacle	0.45 (0.55)	0.69 (0.61)
Very severe obstacle	0.27 (0.86)	0.30 (0.86)
Customs and trade (omitted: no obstacle)		
Minor obstacle	0.75 (0.47)	0.72 (0.45)
Moderate obstacle	1.31** (0.63)	1.24** (0.60)
Major obstacle	0.98 (0.61)	0.87 (0.60)
Very severe obstacle	1.23 (1.45)	1.27 (1.42)
Informal sector competitors (omitted: no obstacle)		
Minor obstacle	-0.14 (0.41)	-0.26 (0.43)
Moderate obstacle	0.11 (0.29)	0.049 (0.32)

(Table Continued on next page)

TABLE E.2: Effect of Access to Finance and Business Environment Constraints on Firms Growth, Subjective Measures, 2013 (Continued)

	NO CONTROLS	FIRM CONTROLS
Major obstacle	0.15 (0.25)	0.033 (0.26)
Very severe obstacle	0.16 (0.57)	0.17 (0.56)
Access to land (omitted: no obstacle)		
Minor obstacle	0.040 (0.26)	0.15 (0.27)
Moderate obstacle	-0.35 (0.62)	-0.29 (0.65)
Major obstacle	-0.12 (0.34)	-0.11 (0.34)
Very severe obstacle	-0.80 (0.71)	-0.69 (0.71)
Crime and theft (omitted: no obstacle)		
Minor obstacle	-0.070 (0.38)	-0.084 (0.37)
Moderate obstacle	-0.72** (0.36)	-0.72** (0.37)
Major obstacle	-0.30 (0.43)	-0.24 (0.43)
Very severe obstacle	1.58* (0.88)	1.64* (0.90)
Tax Rate (omitted: no obstacle)		
Minor obstacle	-0.42 (0.69)	-0.43 (0.71)
Moderate obstacle	0.67 (0.72)	0.74 (0.72)
Major obstacle	0.34 (0.58)	0.47 (0.61)
Very severe obstacle	0.080 (0.54)	0.15 (0.54)
Tax administration (omitted: no obstacle)		
Minor obstacle	-0.43 (0.35)	-0.51 (0.39)
Moderate obstacle	-1.20 (0.80)	-1.30 (0.83)
Major obstacle	-0.66 (0.54)	-0.76 (0.59)
Very severe obstacle	-0.76 (0.60)	-0.94 (0.67)
Business licensing and permits (omitted: no obstacle)		
Minor obstacle	-0.24 (0.31)	-0.29 (0.33)
Moderate obstacle	0.021 (0.32)	0.048 (0.31)
Major obstacle	0.40 (0.39)	0.54 (0.42)
Very severe obstacle	-0.12 (0.43)	-0.12 (0.45)

(Table Continued on next page)

TABLE E.2: Effect of Access to Finance and Business Environment Constraints on Firms Growth, Subjective Measures, 2013 (Continued)

	NO CONTROLS	FIRM CONTROLS
Political instability (omitted: no obstacle)		
Minor obstacle	0.23 (0.58)	0.26 (0.72)
Moderate obstacle	-1.74* (1.04)	-1.64* (0.84)
Major obstacle	-0.080 (0.44)	0.076 (0.57)
Very severe obstacle	0.59 (0.75)	0.61 (0.78)
Corruption (omitted: no obstacle)		
Minor obstacle	-0.30 (0.42)	-0.26 (0.41)
Moderate obstacle	-0.14 (0.50)	-0.24 (0.53)
Major obstacle	0.59 (0.51)	0.59 (0.58)
Very severe obstacle	-0.13 (0.57)	0.011 (0.55)
Courts (omitted: no obstacle)		
Minor obstacle	0.33 (0.33)	0.35 (0.35)
Moderate obstacle	-0.0010 (0.34)	0.070 (0.37)
Major obstacle	-0.39 (0.50)	-0.39 (0.51)
Very severe obstacle	-0.91 (0.83)	-0.89 (0.86)
Labor regulations (omitted: no obstacle)		
Minor obstacle	0.30 (0.34)	0.50 (0.37)
Moderate obstacle	-1.06 (1.02)	-1.00 (1.01)
Major obstacle	-0.37 (0.62)	-0.25 (0.59)
Very severe obstacle	-2.22* (1.33)	-2.54* (1.38)
Low educational level of labor force (omitted: no obstacle)		
Minor obstacle	-0.29 (0.57)	-0.32 (0.57)
Moderate obstacle	0.17 (0.34)	0.19 (0.34)
Major obstacle	0.058 (0.27)	-0.070 (0.27)
Very severe obstacle	0.48 (0.56)	0.39 (0.55)

(Table Continued on next page)

TABLE E.2: Effect of Access to Finance and Business Environment Constraints on Firms Growth, Subjective Measures, 2013 (Continued)

	NO CONTROLS	FIRM CONTROLS
Region (omitted: Arusha)		
Dar Es Salaam	-0.035 (0.29)	0.0016 (0.43)
Mbeya	-0.50 (0.56)	-0.32 (0.72)
Mwanza	-1.30 (0.96)	-1.31 (0.96)
Zanzibar	2.22 (1.79)	2.18 (1.84)
Sector		
Textiles and garments		-0.25 (0.31)
Other manufacturing		-0.75** (0.30)
Size of the enterprise (omitted: micro)		
Small		0.57** (0.27)
Mature		-0.69** (0.35)
Older		-0.062 (0.38)
Constant	-0.38 (1.21)	-0.18 (1.20)
Observations	902	898
R ²	0.175	0.190
Adjusted R ²	0.108	0.117

Source: Enterprise Survey 2013.

Notes: Standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

TABLE E.3: Effect of Objective Measure of Access to Finance on Firms Growth, 2013

	1	2	3	4
Credit Constraint Status (CCS) <i>(omitted: Full Credit Const.)</i>				
Partial Credit Constrained (PCC)	0.31 (0.24)	0.31 (0.24)	0.36 (0.24)	0.33 (0.24)
Maybe Credit Constrained (MCC)	0.61** (0.30)	0.61** (0.30)	0.84** (0.39)	0.72** (0.32)
Non Credit Constrained (NCC)	0.24 (0.41)	0.23 (0.41)	0.27 (0.39)	0.25 (0.40)
Sector				
Textiles and garments	-0.18 (0.20)	-0.18 (0.20)	-0.17 (0.21)	-0.19 (0.20)
Other manufacturing	-0.64** (0.29)	-0.64** (0.30)	-0.66** (0.30)	-0.63** (0.30)
Region <i>(omitted: Arusha)</i>				
Dar Es Salaam	-0.51* (0.30)	-0.51* (0.30)	-0.52* (0.30)	-0.50* (0.29)
Mbeya	-0.34 (0.25)	-0.34 (0.25)	-0.38 (0.25)	-0.35 (0.25)
Mwanza	0.14 (0.29)	0.14 (0.29)	0.14 (0.29)	0.14 (0.29)
Zanzibar	-0.47 (0.51)	-0.47 (0.51)	-0.55 (0.52)	-0.51 (0.51)
Size of the enterprise <i>(omitted: micro)</i>				
Small	0.39** (0.17)	0.39** (0.17)	0.40** (0.18)	0.41** (0.18)
Mature	-0.36** (0.14)	-0.36** (0.14)	-0.38** (0.16)	-0.36** (0.14)
Older	-0.14 (0.19)	-0.14 (0.20)	-0.16 (0.19)	-0.13 (0.20)
Regulation (# of visits)	0.00058 (0.0011)	0.00061 (0.0011)	0.00011 (0.0010)	0.00027 (0.00099)
Overdraft		0.028 (0.15)		
Creditline			-0.51 (0.64)	
Creditline and overdraft				-0.16 (0.24)
Constant	0.19 (0.25)	0.19 (0.25)	0.16 (0.25)	0.19 (0.25)
Observations	764	764	764	764
R ²	0.030	0.030	0.033	0.031
Adjusted R ²	0.011	0.010	0.013	0.011

Source: Enterprise Survey 2013

Notes: Column one contains the results of estimations using credit constrained status (CCS) and firm controls, column 2 adds overdraft only, column 3 adds loans and credit lines only, and column 4 adds both *creditline* and *overdraft*. Standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$



APPENDIX F

A Summary of Theoretical Contributions on ROSCAs



A ROSCA may be described in formal terms as follows.

Some number n of individuals agree to meet on a regular basis. At each meeting, each individual brings an amount of cash B/n . The collected amount, or pot, B , is then handed over to one participant, either drawn at random among those who have not yet received the pot (this is the random ROSCA), or according to a pre-determined order (fixed ROSCA). The ROSCA ends when all the participants have received the pot exactly once. If participants prefer to receive the pot earlier, perhaps to be able to enjoy the benefits associated with it (consumption, investment, etc.), they would be willing to contribute more than B/n to obtain the pot early. Bidding ROSCAs (many variants of which can be imagined) allow participants to do so.

Three motivations for participating in a ROSCA have been identified in the theoretical literature:

- *The early pot motive.* ROSCAs enable all but one of the participants to get access to the amount B earlier than under autarky. In their seminal theoretical analysis of random and bidding ROSCAs, Besley, Coate, and Loury (1993) formalize this argument in a model where individuals use the amount B to buy a durable good. In this setting, they also find that random ROSCAs dominate bidding ROSCAs from a welfare perspective if individuals are homogenous, while the reverse may be true if there is heterogeneity in the marginal consumption utility derived from the durable good.
- *The savings commitment motive.* Even absent consumption of durable goods, ROSCAs can provide a useful commitment device for individuals with limited self-control. Ambec and Treich (2007) formalize this idea in a model where an individual would spend cash on his hands on a good that he would rather refrain from buying from an ex ante perspective. Such an individual is better off in an arrangement that leaves him with cash on his hands once instead of n times, since this thus reduces his consumption of the superfluous good. Gugerty (2007) makes a similar point in a different model.
- *The household conflict motive.* A ROSCA may be useful for an individual who (i) belongs to a household in which decisions to purchase durable goods are joint, (ii) has a stronger preference for the durable good than the other household member(s), and (iii) has limited power in the intra-household bargaining process. Membership in a ROSCA empowers such an individual by rendering the decision to

save for the durable good a *fait accompli*. Anderson and Baland (2002) show that this may trigger membership in a ROSCA, even if there is a fixed cost associated with such membership.

Being informal, ROSCAs must be self-enforcing. This issue is not trivial. For instance, in a random ROSCA, the participant who receives the pot first has no incentive to continue paying his remaining dues. In a fixed ROSCA, the participant who is designated to be the last one to receive the pot may prefer to not participate, if his main motive for participating is the early pot motive. Anderson, Baland, and Moene (2009) examine this issue in detail for random and fixed ROSCAs, when these are repeated and individuals are infinitely lived. They ask whether enforcement may be achieved either through exclusion from future ROSCAs, through the order in which the pot is distributed, or through a membership fee that is lost if a participant defaults. Their findings inspire pessimism. As an illustration, they show that even the strongest possible punishment through exclusion, in the form of permanent exclusion from any future ROSCA following the first default, does not ensure enforcement in random ROSCAs, when the desire to participate is driven by the early pot motive. The logic is clear. Consider a participant who receives the pot at the first meeting. If he defaults he avoids paying the remaining $(n-1)B/n$ and he can save an amount B every n periods on his own. If he does not default, he pays the remaining $(n-1)B/n$ and the expected wait time until he gets the pot again is $(n-1)+n/2 > n$. Nonetheless, as Anderson, Baland, and Moene (2009), and also Besley, Coate, and Loury (1993) point out, enforcement may be ensured if large enough social sanctions can be inflicted on defaulters.





References



- Alby, Philippe, Emmanuelle Auriol, and Pierre Nguimkeu. 2019. "Does Social Pressure Hinder Entrepreneurship in Africa? The Forced Mutual Help Hypothesis", *Economica*, forthcoming.
- Alesina, Alberto, and Paola Giuliano. 2010. "The Power of the Family." *Journal of Economic Growth*, 15, 93–125.
- Alesina, Alberto, and Paola Giuliano. 2015. "Culture and Institutions," *Journal of Economic Literature*, 53, 898–944.
- Algan, Yann, and Pierre Cahuc. 2014. "Trust, Well-being and Growth: New Evidence and Policy Implications," in Aghion, Philippe, and Steven Durlauf (eds.) *Handbook of Economic Growth*. New York: Elsevier Science.
- Alger, Ingela, Laura Juarez, Miriam Juarez-Torres, and Josepa Miquel-Florensa. 2019. "Do Informal Transfers Induce Lower Efforts? Evidence from Lab-in-the-field Experiments in Rural Mexico," *Economic Development and Cultural Change*.
- Alger, Ingela, and Jörgen W. Weibull. 2008. "Family Ties, Incentives and Development: A Model of Coerced Altruism." In Basu, Kaushik and Ravi Kanbur, eds., *Arguments for a Better World: Essays in Honor of Amartya Sen, Volume II: Society, Institutions and Development*. Oxford: Oxford University Press.
- Alger, Ingela, and Jörgen W. Weibull. 2010. "Kinship, Incentives and Evolution." *American Economic Review*, 100, 1725–1758.
- Allen, Robert C. (2000). "Economic structure and agricultural productivity in Europe, 1300–1800," *European Review of Economic History*, 3, 1–25.
- Ambec, Stefan, and Nicolas Treich. 2006. "ROSCAs as Financial Agreements to Cope with Self-control Problems," *Journal of Development Economics*, 82, 120–137.
- Angelucci, Manuela, Giacomo De Giorgi, Marcos A. Rangel, and Imran Rasul. 2009. "Village Economies and the Structure of Extended Family Networks," *The Berkeley Electronic Journal of Economic Analysis & Policy*, 9 (1).
- Andreoni, James. 1990. "Impure Altruism and Donations to Public Goods: A Theory of Warm-Glow Giving," *Economic Journal*, 100, 464–477.
- Arnott, Richard and Joseph Stiglitz. 1988. "The Basic Analytics of Moral Hazard," *Scandinavian Journal of Economics*, 90, 383–413.
- Arnott, Richard and Joseph Stiglitz. 1990. "The Welfare Economics of Moral Hazard," NBER Working Paper 3316.
- Arrow, Kenneth J. (1963) "Uncertainty and the Welfare Economics of Medical Care," *American Economic Review*, 53, 941–73.
- Attanasio, Orazio, Abigail Barr, Juan Camilo Cardenas, Garance Genicot, and Costas Meghir. 2012. "Risk Pooling, Risk Preferences, and Social Networks," *American Economic Journal: Applied Economics*, 4, 134–167.
- Azam, Jean-Paul, and Flore Gubert. 2005. "Those in Kayes. The Impact of Remittances on their Recipients in Africa," *Revue Économique*, 56, 1331–1358.
- Badiane, Ousmane, Odjo, Sunday, and Collins, Julia (Eds). 2018. *Africa Agriculture Trade Monitor Report 2018*. Washington, DC: International Food Policy Research Institute (IFPRI).
- Baland, Jean-Marie, Isabelle Bonjean, Catherine Guirkinger, and Roberta Ziparo. 2016. "The Economic Consequences of Mutual Help in Extended Families," *Journal of Development Economics*, 123, 38–56.
- Baland, Jean-Marie, Catherine Guirkinger, and Charlotte Mali. 2011. "Pretending to Be Poor: Borrowing to Escape Forced Solidarity in Cameroon," *Economic Development & Cultural Change*, 60, 1–16.
- Banerjee, Abhijit, Arun Chandrasekhar, Esther Duflo, and Matthew Jackson. 2013. "The Diffusion of Microfinance," *Science*, 341(6144).
- Banerjee, Abhijit, Arun Chandrasekhar, Esther Duflo, and Matthew Jackson. 2018. "Changes in Social Network Structure in Response to Exposure to Formal Credit Markets." Working paper MIT and Stanford.
- Becker, Gary S. 1974. "A Theory of Social Interactions," *Journal of Political Economy*, 82, 1063–1093.
- Gary S. Becker (1981). *A Treatise on the Family*. Cambridge, MA: Harvard University Press.
- Bénabou, Roland, and Jean Tirole. 2006. "Belief in a Just World and Redistributive Politics," *Quarterly Journal of Economics*, 121, 699–746.
- Blau, P. M., Gustad, J. W., Jessor, R., Parnes, H. S., & Wilcock, R. C. 1956. "Occupational Choice: A Conceptual Framework," *ILR Review*, 9, 531–543.

- Boltz, Marie, Karine Marazyan, and Paola Villar. 2015. "Income Hiding and Informal Redistribution: A Lab in the Field Experiment in Senegal," PSE Working Papers n 2015–15.
- Bramoullé, Yann, and Gilles Saint-Paul. 2010. "Social Networks and Labor Market Transitions," *Labour Economics*, 17, 188–195.
- Christiaensen, Luc. 2017. "Agriculture in Africa – Telling myths from facts: A synthesis," *Food Policy*, 67, 1–11.
- Datta, Saugato, and Sendhil Mullainathan. 2014. "Behavioral Design: A New Approach to Development Policy," *Review of Income and Health*, 60, 7–35.
- Davis, Benjamin, Stefania Di Giuseppe, and Alberto Zezza. 2017. "Are African households (not) leaving agriculture? Patterns of households' income sources in rural Sub-Saharan Africa," *Food Policy*, 67, 153–174,
- Di Falco, Salvatore, and Erwin Bulte. 2011. "A Dark Side of Social Capital? Kinship, Consumption, and Savings," *Journal of Development Studies*, 47, 1128–1151.
- Di Falco, Salvatore, and Erwin Bulte. 2013. "The Impact of Kinship Networks on the Adoption of Risk-Mitigating Strategies in Ethiopia," *World Development*, 43, 100–110.
- Duesenberry, James S. 1949. *Income, Saving and the Theory of Consumer Behavior*. Cambridge, MA: Harvard University Press.
- Fafchamps, Marcel. 2011. "Risk Sharing Between Households," in Benhabib, Jess, Alberto Bisin, and Matthew O. Jackson (eds.). *Handbook of Social Economics*, Amsterdam: North-Holland.
- Falk, A., Becker, A., Dohmen, T., Enke, B., Huffman, D., & Sunde, U. 2018. "Global evidence on economic preferences," *Quarterly Journal of Economics*, 133, 1645–1692.
- Fowowe, Babajide (2017). Access to finance and firm performance: Evidence from African countries. *Review of Development Finance* 7, 6–17.
- Fox, Louise, and Thomas Pave Sohnesen. 2012. "Household Enterprises in Sub-Saharan Africa: Why They Matter for Growth, Jobs, and Livelihoods." Policy Research Working Paper No. 6184. World Bank, Washington, DC.
- Frank, Robert H. *Choosing the Right Pond: Human Behavior and the Quest for Status*. New York: Oxford University Press, 1985.
- Grimm, Michael, Flore Gubert, Ousman Koriko, Jann Lay, and Christopher J. Nordman. 2013. "Kinship-ties and Entrepreneurship in Western Africa," *Journal of Small Business and Entrepreneurship*, 26, 125–150.
- Grimm, Michael, Renate Hartwig, and Jann Lay. 2016. "Does Forced Solidarity Hamper Investment in Small and Micro Enterprises?" *Journal of Comparative Economics*, online July 2016.
- Haltiwanger, J.C., Jarmin, R.S., Miranda, J., (2013). Who creates jobs? *Rev. Econ. Stat.* 95(2), 347–361.
- Helpman, Elhanan and Jean-Jacques Laffont. 1975. "On Moral Hazard in General Equilibrium Theory," *Journal of Economic Theory*, 10, 8–23.
- Jakiela, Pamela, and Owen Ozier. 2016. "Does Africa Need a Rotten Kin Theorem? Experimental Evidence from Village Economies," *Review of Economic Studies*, 83, 231–268.
- Jensen, Robert, and Emily Oster. 2009. "The Power of TV: Cable Television and Women's Status in India," *Quarterly Journal of Economics*, 124, 1057–1094.
- Jütting, J., Parlevliet, J. and Xenogiani, T. (2008), Informal Employment Re-loaded. *IDS Bulletin*, 39: 28–36.
- Kweka, Josaphat, and Louise Fox. 2011. *The Household Enterprise Sector in Tanzania: Why It Matters and Who Cares? Poverty Reduction and Economic Management*. The World Bank. Washington DC.
- Kranton, Rachel E, 1996. "Reciprocal Exchange: A Self-Sustaining System," *American Economic Review*, 86, 830–851.
- Kranton, Rachel E., and Deborah F. Minehart. 2001. "A Theory of Buyer-Seller Networks," *American Economic Review*, 91, 485–508.
- La Ferrara, Eliana, Alberto Chong, and Suzanne Duryea. 2012. "Soap Operas and Fertility: Evidence from Brazil," *American Economic Journal: Applied Economics*, 4, 1–31.
- Levine, Ross & Beck, Thorsten & Demircuc-Kunt, Asli. (2005). SMEs, Growth, and Poverty: Cross-Country Evidence. *Journal of Economic Growth*. 10. 199-229. 10.1007/s10887-005-3533-5.
- Maksimov, Vladislav, Wang, Stephanie Lu and Luo, Yadong, (2017), Reducing poverty in the least developed countries: The role of small and medium enterprises, *Journal of World Business*, 52, issue 2, p. 244–257.

- Mead, Donald C. and Liedholm, Carl, (1998), The dynamics of micro and small enterprises in developing countries, *World Development*, 26, issue 1, p. 61–74.
- McCullough, E. B. 2015. Understanding Agricultural Labor Exits in Tanzania. In 2015 AAEA & WAEA Joint Annual Meeting, July 26-28, San Francisco, California (No. 206080). Agricultural and Applied Economics Association & Western Agricultural Economics Association.
- McCullough, Ellen B. 2017. "Labor productivity and employment gaps in Sub-Saharan Africa", *Food Policy*, 67, 133–152.
- McMillan, Margaret, and Kenneth Harttgen. 2015. "Africa's Quiet Revolution," in Monga, Celestin and Lin, Justin Yifu, (2015), *The Oxford Handbook of Africa and Economics: Volume 2: Policies and Practices*, Oxford University Press.
- McMillan, Margaret S., Dani Rodrik, and Claudia Sepúlveda (2017) *Structural change, fundamentals, and growth: A framework and case studies*. Washington, D.C.: International Food Policy Research Institute (IFPRI).
- Morisset, Jacques, and Mahjabeen Haji. 2014. "Tanzania: Productive Jobs Wanted," The World Bank Group. Washington DC.
- Neumark, D., Wall, B., Zhang, J., (2011). Do Small Businesses Create More Jobs? New Evidence for the United States from the National Establishment Time Series. *Rev. Econ. Stat.* 93(1), 16–29.
- Nichter, Simeon and Goldmark, Lara, (2009), Small Firm Growth in Developing Countries, *World Development*, 37, issue 9, p. 1453–1464.
- Pauly, Mark V. 1968. "The Economics of Moral Hazard: Comment," *American Economic Review*, 58, 531–537.
- Ray, Debraj. 2006. "Aspirations, Poverty and Economic Change," in Banerjee, Abhijit, Roland Bénabou, and Dilip Mookherjee (eds.) *What Have We Learned About Poverty?* Oxford: Oxford University Press.
- Rijkers, B., Freund, C., Nufifora, A., (2014). Which firms create the most jobs in developing countries? Evidence from Tunisia. *Labour Economics* 31(2014), 84–102.
- Sánchez Puerta, Maria Laura, M. Julia Granata, Odette Maciel Becerril, Gwendolyn Heaner, and Mohamed Ihsan Ajwad. 2007. "Untapped potential: giving household enterprises the chance to succeed in Tanzania." *World Bank Report*. Washington, D.C.
- Sleuwaegen, Leo and Goedhuys, Micheline, (2002), Growth of firms in developing countries, evidence from Cote d'Ivoire, *Journal of Development Economics*, 68, issue 1, p. 117–135.
- Squires, Munir. 2016. "Kinship Taxation as a Constraint to Microenterprise Growth: Experimental Evidence from Kenya," mimeo, London School of Economics.
- Steven J. Davis and John Haltiwanger (1992), Gross Job Creation, Gross Job Destruction, and Employment Reallocation. *The Quarterly Journal of Economics*, Vol. 107, No. 3, pp. 819–863.
- Todd, Emmanuel. 2011. *L'origine des systèmes familiaux. Tome 1 : L'Eurasie*. Paris : Gallimard.
- Udry, Christopher. 1990. "Rural Credit in Northern Nigeria: Credit as Insurance in a Rural Economy," *World Bank Economic Review*, 4, 251–269.
- Van Biesebroeck, Johannes. 2005. Firm Size Matters: Growth and Productivity Growth in African Manufacturing, *Economic Development and Cultural Change*, 53, issue 3, p. 545–83.
- Zins, A. and Weill, L. 2016. The determinants of financial inclusion in Africa. *Review of Development Finance* 6, 46–57.