

NBER WORKING PAPER SERIES

ECONOMIC TRANSFORMATION IN AFRICA FROM THE BOTTOM UP:
EVIDENCE FROM TANZANIA

Xinshen Diao
Josaphat Kweka
Margaret McMillan

Working Paper 22889
<http://www.nber.org/papers/w22889>

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
December 2016

The authors would like to thank Goodluck Charles and the Financial Sector Deepening Trust (FSDT) for making the firm level data available. We thank Zara Qureshi and Eduardo Magalhaes for excellent research assistance. We thank participants at the STAARS Conference in Addis Ababa, the Annual Bank Conference on Development Economics at World Bank, Washington DC and the 2016 CAER-IFPRI Annual International Conference in Fuzhou, China for many useful comments. We thank the International Growth Centre and CGIAR's Policies, Institutions and Markets (PIM) program for financial support. The views expressed herein are those of the author and do not necessarily reflect the views of the National Bureau of Economic Research.

NBER working papers are circulated for discussion and comment purposes. They have not been peer-reviewed or been subject to the review by the NBER Board of Directors that accompanies official NBER publications.

© 2016 by Xinshen Diao, Josaphat Kweka, and Margaret McMillan. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

Economic Transformation in Africa from the Bottom Up: Evidence from Tanzania
Xinshen Diao, Josaphat Kweka, and Margaret McMillan
NBER Working Paper No. 22889
December 2016
JEL No. O4,O55

ABSTRACT

At roughly 4% per annum, labor productivity in Tanzania has grown more rapidly over the past 12 years than at any other time in recent history. Employment growth has also been strong keeping up with population growth at roughly 2.5 percent per annum; the bulk of employment growth (90%) has been in the non-agricultural sector. However, the vast majority of this non-agricultural employment growth has occurred in the informal sector. Using Tanzania's first nationally representative survey of micro, small and medium sized enterprises - we show that firms in the informal sector contributed roughly half a percentage point to economy-wide labor productivity growth in Tanzania between 2002 and 2012. However, virtually all of the labor productivity growth contributed by informal firms came from a small subset of firms we call the in-between firms. We consider attributes of the in-between firms that could be used for targeting financial and business services to firms with the potential to grow. We find two salient characteristics of firms in the in-between sector that might lend themselves to targeting – their owners are more likely to keep written accounts and they are more likely to keep their savings in formal bank accounts.

Xinshen Diao
Senior Research Fellow, IFPRI
Deputy Division Director, DSG
International Food Policy Research Institute
2033 K Street NW, Washington DC
x.diao@cgiar.org

Josaphat Kweka
Economic and Social Research Foundation
(ESRF)
josaphat.kweka@gmail.com

Margaret McMillan
Tufts University
Department of Economics
114a Braker Hall
Medford, MA 02155
and International Food Policy Research Institute
and also NBER
margaret.mcmillan@tufts.edu

1. Introduction

Africa's impressive performance over the past two decades has been accompanied by a proliferation of small firms, many of which operate in the informal sector. Researchers at the African Development Bank (2013) estimate that the informal sector accounts for around 55% of Sub-Saharan Africa's GDP and 80% of its' employment¹. This is potentially alarming since firms in the informal sector are widely viewed as unproductive employers of last resort².

Yet, there is also a large body of literature which documents significant heterogeneity among small typically informal firms in developing countries³. Schoar (2009) argues that unless we understand this heterogeneity, development policies aimed at fostering entrepreneurship are likely to be unsuccessful. Both Schoar (2010) and La Porta and Shleifer (2011 and 2014) argue that the number of entrepreneurs that transition from the informal sector to the formal sector is likely to be small. However, as Li and Rama (2015) point out – we actually don't know a whole lot about these firms because of a lack of comprehensive nationally representative firm level data. It follows that we do not understand very well the role that small largely informal firms play in the growth and development of poor economies.

Our goal in this paper is to contribute to our understanding of the role that small firms play in a rapidly growing but still poor African economy. We choose Tanzania for a couple of reasons. First, the government of Tanzania's national statistics office makes available on its website most of the data required to estimate the contribution of the informal sector to labor productivity and employment growth. Second, Tanzania has one of the only nationally representative firm level surveys of micro, small and medium sized enterprises in Africa. While household surveys are often nationally representative and sometimes capture self-employment they cannot be used to obtain an accurate picture of firm level activity. The same is true of labor force surveys.

We begin our analysis using national accounts data and census data to show that between 2002 and 2012 Tanzania's economy grew more rapidly than at any other time in recent history; average annual GDP growth was 6.5% and average annual labor productivity growth was 4.1%. More than three quarters of this labor productivity growth was accounted for by structural change; the remainder of the growth is largely attributable to within sector productivity growth in agriculture. The labor

¹ These numbers also include agriculture. In this paper, we focus on the non-agricultural private sector. There is clearly room for modernizing agriculture but that is not the focus of this paper.

² See for example La Porta and Shleifer (2011 and 2014).

³ See for examples Grimm et al (2011), McKenzie and Woodruff (2008) Fafchamps et al (2014) among others.

productivity growth attributable to structural change is almost entirely explained by a rapid decline in the agricultural employment share and an increase in the non-agricultural private sector employment share. Combining the information from the census data with information from the Formal Employment and Earnings Survey (FEES) we estimate that only 11.5% of employment growth in the private nonagricultural economy is due to the expansion of the formal private sector; the remaining 88.5% of employment growth occurred outside the formal sector. The two sectors that contributed most significantly to labor productivity growth were manufacturing and trades services. Job creation in these two sectors was dominated by the informal sector leaving open the possibility that informal firms contributed to economywide labor productivity growth.

Since we do not have a nationally representative firm level panel that captures firms of all sizes in both the formal and informal sectors, we cannot directly compute the contribution of formal and informal firms to economywide labor productivity growth. Instead, we use Tanzania's first nationally representative survey of micro, small and medium sized enterprises (MSMEs) to estimate first the size of the informal sector that has average labor productivity levels above the economywide average in trade services and second in manufacturing. Our reasoning for this approach is that only the firms with above average labor productivity at the end of the period could have contributed to economywide labor productivity growth between 2002 and 2012. Using the manufacturing cutoff, we find that that 5.7% of MSMEs account for 30.7% of the value-added per worker produced by MSMEs; using the trade services cutoff, we find that 10.38% of MSMEs account for 37.4% of the value-added per worker created by MSMEs.

Having identified MSME firms with above average productivity, we then explore the extent to which observable characteristics of these firms and their owners predict firm performance relative to the rest of the firms in the MSME sample. This exercise serves two purposes. First, by using firm characteristics that others have found to be good predictors of firm performance, we are able to check the reliability of our productivity estimates. For example, it is widely accepted that electricity use enhances firm level labor productivity. If we do not find that electricity use is positively correlated with firm level labor productivity we would have less confidence in our measures of labor productivity. Second, identification of salient traits of productive businesses may help us to think about the role of targeting designed to enhance business performance in Tanzania and other developing countries. We find that keeping written accounts and keeping savings in a formal bank account are positively correlated with labor productivity. By contrast, measures associated with formality such as having a

tax identification number or being registered with Tanzania's Business Registration and Licensing Agency (BRELA) are not significant predictors of labor productivity.

The evidence presented in this paper contributes to the small but growing literature on structural change in Africa by demonstrating the role played by the large and growing number of informal businesses in one African country that has experienced rapid labor productivity growth. Our work reinforces the work of Schoar (2010) and others who argue that programs designed to stimulate entrepreneurship in developing countries must take into account the heterogeneous nature of small firms and their owners⁴. This argument is supported by research which shows that the impact of access to credit on business outcomes depends on borrower attributes⁵ (de Mel et al 2008, Banerjee et al (2015). Our analysis of MSME's also contributes to a growing body of literature that attempts to identify high potential firms or what are commonly referred to as gazelles⁶. However unlike previous researchers who have tended to use very small samples, we have access to a large nationally representative sample of micro, small and medium sized firms. Finally, our work contributes to an ongoing effort by senior researchers and policymakers in Tanzania to better understand the nature of the informal economy in Tanzania in order to guide national policy (Mmari and Wangwe, 2016).

The remainder of this paper is organized as follows. In Section 2, we briefly describe the datasets used for this analysis. In Section 3, we place Tanzania's MSMEs in the context of the macro economy and estimate their contribution to economywide labor productivity growth. In Section 4, we explore the correlates of the most productive firms and describe analyze their constraints to doing business relative to the rest of the MSMEs. In Section 5, we explore the extent to which MSMEs might contribute to future labor productivity and employment growth. In Section 6, we discuss what it would mean to include these firms in a growth strategy. Section 7 concludes.

2. The Macro Setting: Structural Change, Productivity Growth and Employment

Before diving into our analysis, a few words are in order about the data and our definition of informality. Our value added data is drawn from two reports published by the National Bureau of Statistics (NBS, 2014a and 2014b). The statistics in the second NBS report (2014b) reflect the national accounts rebasing using 2007 as the base year and thus our results incorporate that rebasing. Our total employment figures are also based on two reports published by the NBS based on the 2002 and 2012

⁴ See for example Banerjee et al (2015) and McKenzie (2015).

⁵ See for example de Mel et al (2008) and Banerjee et al (2015)

⁶ See for example Grimm et al (2012) and Fafchamps and Woodruff (

censuses in which employment is reported at the industry level (NBS 2006 and NBS 2014d). Formal sector employment is based on NBS' Formal Employment and Earnings Survey (FEES) (NBS 2007 and 2014c). Our measure of employment in the informal sector is computed as the difference between total employment as reported in the census and formal sector employment as reported in FEES. Finally, our measure of formal sector value added in six sub-sectors of manufacturing are based on two reports published by the Ministry of Industry and Trade (2010, 2012).

2.1 Economic Growth in Tanzania 1988-2014

Between 2000 and 2014 Tanzania's economy grew more rapidly than at any other time in recent history, with the annual GDP growth rate averaging 6.7% (Figure 1). An important feature of this recent performance is that it has been inclusive in nature; growth in total employment has been at par with population growth. A second important feature of this recent growth is that it has been accompanied by strong labor productivity growth: labor productivity grew by 4.1% per year annually between 2002 and 2012. Additionally, rapid growth in the country's manufacturing sector implies that there are no signs of deindustrialization: the sector's GDP grew at 8% per year between 2000 and 2014 - more than three times the growth experienced in 1988-1999 (Figure 1).

2.2 Structural Change Accounts for Most of the Productivity Growth

To better understand the nature of Tanzania's recent growth, we employ the growth decomposition methodology developed by McMillan and Rodrik (2011). To this end, we aggregate the economy into 10 main subsectors and decompose economy-wide labor productivity into that which can be attributed to within sector productivity growth and that which can be attributed to structural change. For the purposes of this paper, we define within sector productivity growth as growth in labor productivity in any of the ten sub-sectors and we define productivity growth attributable to structural change as the productivity growth that occurs when employment is reallocated across these ten sub-sectors as a result of different levels of average labor productivity. Details of the growth decomposition are presented in Appendix 1.

Table 1 highlights the main results of this exercise. Our analysis confirms that close to 80% of Tanzania's recent growth in labor productivity is attributable to structural change. Employment shares have declined in agriculture – the sector with the lowest average labor productivity – and increased in various nonagricultural sectors, most of which are significantly more productive than agriculture.

The growth decomposition presented in Table 1 tells us nothing about whether structural change in Tanzania was the result of job creation or simply labor reallocation across sectors. Like many African countries, Tanzania has had a relatively high population growth rate over the past decade leading millions of young people to enter the job market. To this end, Table 2 links the growth in employment with the change in the economic structure by displaying ‘new’ employment opportunities across all nonagricultural sectors.

We define new employment by sector as the net increase in the number of employees in each sector between 2002 and 2012 computed using the population censuses. While the agricultural sector still accounts for the largest share of employment, its’ role in the net increase in the number of employees between 2002 and 2012 is quite small at only 11%; in other words agriculture has not played a very important role in job creation. Instead, almost 90% of the new jobs created over this ten year period were created in the non-agricultural sector. Considering that agricultural employment made up more than 80% of total employment in 2002 (Table 1, first panel, column 6), it is remarkable that the majority of the new jobs were created outside of the agricultural sector in this relatively short period of time.⁷

2.3 Employment in Small Private Firms Dominates Employment Growth

Two key facts need to be highlighted in the ‘new employment’ decomposition presented in Table 2. First, a majority of new jobs were created in the private sector, not the public sector; 83.2% of increased total employment between 2002 and 2012 is accounted for by the private sector; the public sector accounts for only 5.6% of the increase in total employment (Table 2, second column). Second, 73% of the increase in total employment - equivalent to 83% of the net increase in private sector jobs - were created in the informal economy by micro and small firms (Table 2, last column).

This trend in private sector job creation by micro and small firms is often seen as a distressing phenomenon, as firms in the informal economy, or small firms in general, are often associated with low productivity and a lack of dynamism. However, once we link the trend in private sector job creation with the results of the growth decomposition analysis shown in Table 1, the following facts become evident. First, structural change accounted for almost 80% of economy-wide labor productivity growth (Table 1, last row) in Tanzania between 2002 and 2012. Second, structural change was primarily achieved by the growth in employment in small firms in the informal economy. These

⁷ The employment shares of agricultural and non-agricultural sectors in 2002 and 2012 and the annualized growth rate in employment 2002-2012 are reported in Appendix Table 3a.

two facts together raise the possibility that some of Tanzania's growth in labor productivity may be linked to the growth in employment in small firms.

There are two sectors that stand out as having contributed significantly to job creation in Tanzania over the period 2002 to 2012. These are manufacturing and trade services. Average labor productivity in Tanzania's manufacturing sector is more than seven times that of the agricultural sector. Although the sector is still relatively small, because of its extremely high productivity compared with the rest of the economy, increased employment in this sector contributed 12.4% of economy-wide labor productivity growth (Table 1, second panel, column 2). Notably, more than two thirds of this increase in employment is accounted for by small mostly informal firms.

Like manufacturing, trade services productivity is also relatively high in Tanzania. While labor productivity in this sector is only half of that of manufacturing, it is still 3.5 times that of agriculture (Table 1, first panel, columns 1 and 2). More importantly, more new jobs were created in this sector than in any other sector between 2002 and 2012. As Table 2 highlights, amongst the nearly one million new jobs created in trade services, more than 99% were created in by the informal economy. Further, although these jobs were created by small firms in the informal sector, productivity in trade services did not fall. As the growth decomposition analysis of Table 1 shows, within-sector productivity actually increased modestly in the trade services sector between 2002-2012 (Table 1, comparing row 1 to row 2). As a result, job creation in Tanzania's trade services sector accounted for more than 18% of economy-wide productivity growth between 2002 and 2012.

Nonetheless, without more information it is difficult to know what to make of these results. Although employment in the formal sector is growing, it is not growing quickly enough to keep pace with the growth in the labor force. This is problematic since average labor productivity in the formal sector is significantly greater than average labor productivity in the informal sector. Instead, the bulk of the employment growth has come from the entry of small informal firms. To better understand the implications of this pattern of growth, we turn to an in-depth analysis of firms in the informal sector.

3. The Micro Setting: Where Are the Small Firms and What Do They Do?

Based on our analysis in Section 2, we know that the majority of 'new' jobs in Tanzania have been created in the informal sector. In this section, we will use Tanzania's first nationally representative survey of small businesses - The Micro, Small and Medium Sized Enterprise Survey (MSME) 2010 - to assess the extent to which these small businesses contribute to national employment and output.

A significant advantage of this survey is that it is nationally representative; it consists of 6,134 firm level observations representing a little under 3 million businesses and around 5 million employees. However, the survey is not without limitations. First, the sampling frame for this survey is households and the selection of households is based on the 2002 census. This poses at least two problems. First, because the survey is household based, it is representative of households and not businesses. Thus, since Tanzania is still a very poor country, we are likely to be missing some of the more productive businesses. Indeed, an analysis of the data reveals that mid-sized firms are under-represented in this dataset (Financial Sector Deepening Trust, 2012). Second, because the sampling framework is 2002, it oversamples rural households. This is because there was a significant reduction in rural activity between 2002 and 2012 as documented in Section 2 of this paper. Therefore, the reader should keep in mind that our analysis is likely to understate the contribution of small businesses to economy-wide productivity and employment and also to understate the importance of small businesses in urban areas.

3.1 Data and Summary Statistics

A set of summary statistics based on the MSME survey is presented in Table 3. Among the 6,134 sampled firms, a total of 5,653 firms have all of the information reported in Table 3. A t-test of means of observables across samples do not reveal any systematic differences between the two samples⁸. As shown in the first panel of Table 3, most MSMEs are extremely small: mean employment is 1.48. Only 3% of these firms are registered with Tanzania's Business Registration and Licensing Agency (BRELA) that opened in 1999⁹. Similarly, only 5.3% of these firms have a tax identification number. Officially, firms in Tanzania are classified as formal when they are either registered with BRELA or when they have a tax id; thus, our MSME samples consists primarily of small informal firms. While the MSME survey is a household based survey, only 50% of firms report that their businesses are actually operating out of their homes.

As previously noted, because the sampling framework is based on the 2002 census, the sample is heavily skewed towards rural firms; indeed the second panel of Table 3 indicates that 74.1% of firms are located in rural areas. We also report in the second panel of Table 3 average monthly value-added and average monthly sales per firm. The mean value-added of an MSME firm is very close to the

⁸ Not reported in the interest of space constraints but available upon request.

⁹ BRELA is Tanzania's Business Registrations and Licensing Agency. It is a Government Executive Agency and was established on the 28th of October, 1999. The aim of the agency is to ensure that businesses operate in accordance with regulations and to ensure that businesses follow 'sound principles.'

average monthly gross income of a formal employee in Tanzania, which is 336,835 Tanzanian Shillings according to Tanzania's Formal Employment and Earnings Survey 2010. There is enormous variation in monthly value-added among surveyed firms, indicated by the very high value of the standard deviation (s.d.) in Table 3. This productive heterogeneity among small informal firms is a point to which we will return in great detail later on in the paper.

The majority of MSME firms are young as indicated by the mean age of 6.33 years in panel 2 of Table 3. This is consistent with our macro findings that the majority of non-farm private sector jobs created in Tanzania between 2002 and 2012 were created by small informal firms. Panel 2 of Table 3 also indicates that 80% of these businesses operate full time. Panel 3 of Table 3 indicates that roughly one third of these business owners report that the business is the owners' only source of income with a slightly higher share of business owners (40%) reporting that the business is the owners' main source of income. 19.3% of business owners report that farming is their main source of income.

Like their businesses, the owners of these small businesses are also relatively young. The mean age of business owners is 36.9 years; the youngest business owner is 16 and the oldest is 91. Roughly half of these business owners are women.

Finally, we report in panel 4 of Table 3 the category of income of the household in which the business owner resides. There are three categories derived from Tanzania's Household and Budgetary survey: not poor, moderately poor and very poor. 44.9% of the MSME owners households are not poor, 35.2% are moderately poor and 19.9% are very poor.

3.2 Industrial and Geographic Distribution

Although the MSMEs operate in a wide range of activities, the bulk of these activities can be classified into trade services (79.9%) and manufacturing (16.7%). As reported in Table 4, manufacturing enterprises operate in the following 6 sub-sectors: grain milling (1.7%), beverages (8.3%), textiles (3.4%), wood (0.5%), building materials (1.1%) and furniture (1.6%). Firms in the trade services sector operate primarily in retail (47.1%), food services (22.3%) and beverage services (7.9%). Many of these activities appear to have strong links to agriculture but without further information, it is not possible to identify which ones and exactly how these linkages work. This is an important area for future research. The distribution of firms across regions is roughly proportional to regional population shares. However, unlike the distribution of firms, the distribution of employment is almost

evenly split between rural and urban areas indicating that firms in urban areas have on average more employees.

3.3 MSME Coverage of National Employment

In Section 2, we combined census data with Tanzania's Formal Employment and Earnings Survey (FEES) to show that the majority of new jobs created in Tanzania over the past decade are in the informal sector. Here, we combine the MSME data for 2010 with data from the 2012 Census and the Formal Employment and Earnings Survey (FEES) 2012 to get a sense for what the MSME firms represent in terms of national output and employment. Since we are only interested in rough estimates, we chose not to interpolate 2012 census data back to match the 2010 MSME data and instead report actual numbers. Thus, this analysis is likely to understate the importance of MSMEs since this sector is growing more rapidly than the formal sector.

Table 5 summarizes the results of the comparison of MSME employment to census and FEES employment. We report total private non-agricultural employment by data source in the last row of Table 5. As we reported previously, formal private sector employment is about 15% of the total non-agricultural employment reported in the 2012 Census; the implication is that 85% of all private nonagricultural jobs are in the informal sector. The MSME survey covers 83% of the jobs in the informal sector.

At the sector level, the number of employees in the MSME is much higher than in the Census for manufacturing and trade services. In manufacturing, the total number of employees covered by the MSME survey doubles the informal manufacturing employment numbers obtained by taking the difference between the census and FEES. In the trade services sector, the total number of employees covered by the MSME survey is more than 50% greater than what is reported in the census. In addition, in other small informal business activities, such as construction and transport, there are very few firms covered by the MSME survey, indicating that such economic activities are under-represented in the MSME survey. Furthermore, personal services, which account for 25% of total informal non-agricultural employment in the Census, are not considered small businesses and hence are not covered by the MSME survey.

Most of the employment related discrepancies in the sectoral breakdowns between the MSME data and the census data can be explained by digging deeper into the data. First, the MSME survey covers businesses that do not run full time, and employees of such part time businesses may have

been counted in the Census as farm workers. In fact, more than 25% of the rural MSME firms identified agriculture as their main source of income and 32% of rural households operating in MSME manufacturing identified agriculture as their main source of income. Second, though the Census reports fewer informal workers in the “Hotel, Restaurants and Food Services” industry than the MSME, a possible explanation for this could be that the Census counts only the employees of hotels and restaurants in this sector, designating small business owners of food and beverage services to other service activities.

3.4 MSME Coverage of National Output

In addition to the MSME contribution to employment, we would like to know how much the MSMEs contribute to total output of the economy. According to the “National Baseline Survey Report for Micro, Small, and Medium Enterprises in Tanzania”, MSMEs contributed around 27% to Tanzania’s GDP in 2010 (Ministry of Trade and Industry, 2012, p15). In our view this estimate is too high because it fails to take into account seasonality associated with MSMEs. Since the MSME questionnaire asks business owners about their monthly sales, we are able to compute a seasonally adjusted value of output per work by firm (see online Appendix 2 for details of this calculation). Using this methodology, we arrive at a lower but we think more realistic estimate for the MSME sector’s value added of about 13.5% of national GDP (see online Appendix for the details of this calculation). The results of this estimation are reported in Table 6.

As reported in Table 6, the value added of the MSME sector accounted for 25% of national private non-agricultural GDP in 2010. The contribution of the MSME sector to manufacturing value-added is roughly 18%. In manufacturing, the MSMEs are concentrated in six sub-sectors: beverages, food processing, textiles, wood processing, furniture, and building materials.¹⁰ We also present the value-added of these six manufacturing sub-sectors contributed by firms in the formal sector using Tanzania’s Annual Survey of Industrial Production (ASIP) for the years 2008 and 2009 (the two most recent rounds of ASIP). We find that in some cases, small informal firms seem to play the dominant

¹⁰ Though the value added numbers for these six sub-sectors of manufacturing is not available in the National Account data, according to the Annual Survey of Industrial Production (ASIP), these six manufacturing sectors account for less than 50% of total formal manufacturing. Therefore, we can say with confidence that the contribution of MSMEs in these six manufacturing sectors would be much higher than their contribution to the overall manufacturing sector.

role as their total value-added contribution is actually higher than that of their counterpart formal firms.

In summary, although MSMEs do contribute to national output, their contribution to employment is far greater. This is an indication that MSMEs have lower average productivity than formal firms in the same private non-agricultural sectors. This leads to the next section of this paper in which we explore the productive heterogeneity of MSMEs.

4. Quantitative and Qualitative Characteristics of MSMEs and Their Owners

Before proceeding further, it is worth stressing what we are and are not attempting to do in this section of the paper. Our goal here is to try to understand which – if any – of the MSMEs might be able to contribute to economywide labor productivity growth while at the same time providing employment. We view this exercise in the spirit of Schoar’s (2010) work who argues that policy that fails to take into account the heterogeneity of small businesses in the informal sector is likely to yield disappointing results. Indeed, the work of Banerjee et al (2015) indicates that at least one very large scale microfinance program that was at least in part designed to foster entrepreneurship had little to no average impact on business outcomes. Subsequent work by these same authors suggests that one of the reasons for the disappointing average effects is that not all businesses are destined for success. We structure our investigation into the heterogeneity of these businesses around the self-reported motivations of business owners, the productivity of MSMEs and the correlates of highly productive MSMEs.

4.1 Self-reported Motivations of Small Business Owners

The MSME survey includes three questions designed to elicit the reasons for opening a business. The responses to these questions are tabulated using sample weights in Table 7. The first question is: what was your main occupation before you started this business? Notably, only 7.56% of respondents reported that they were previously unemployed prior to starting a business. The second question is: for what reason did you choose your line of business? A little under half of all business owners say that the reason they chose their line of business is because they saw a market opportunity. The second most common reason for operating in a particular line of business is that the owners’ capital could only finance that line of business. The third and most common reason for picking a line of business was having experience in that line of business and the fourth reason was having friends and family who operated a similar business.

The third question is: if you were offered a full-time salary paying job, would you take it? Responses to this question are reported in the bottom panel of Table 7 and indicate that only 46.57% of small business owners would leave their current business for a full time salaried position. 63.92% of the respondents who would prefer a full time salaried job say they would like to work for the government. This is consistent with results reported in Banerjee and Duflo (2007) and Banerjee et al (2011) about the analysis of the economic lives of the poor. Another 23.99% of the respondents say they would prefer to work for a large private company. The reported reason for preferring a full time salaried position is better security of income.

4.2 Job Creation: the Employment Growth of Small Firms

Our analysis of the dynamics of small firms is severely limited by the cross sectional nature of the data (a second survey is planned for 2017). There is however, a retrospective question that asks business owners how many employees worked in the business when the business started. By combining this information with the number of employees that currently work in the business we are able to come up with an estimate of annualized employment growth. We report on this number but refrain from any detailed analysis of firm size and employment growth since the MSME sample is truncated at both ends of the distribution. In other words, we do not observe firms that exited from the sample and we do not observe firms that graduate out of the sample. Nevertheless, by examining our measure of employment growth among the MSMEs, we can begin to get a sense for whether any of the MSMEs have the potential to grow into larger firms generating employment for the scores of individuals who would rather have salaried jobs than work in a small business and at the same time take advantage of economies of scale.

We find that mean employment growth among MSMEs is 2.2 percent. To put this in perspective, we consider what this implies for an average MSME firm over a ten year period. The average firm has 1.29 full time employees. If employment in the average firm grew at 2.2 percent per year for ten years, the average number of full time employees would increase to only 1.57. The average though significant underlying heterogeneity. Our data reveal that 87.76 percent of MSMEs never grow and that the average growth rate among the firms that do grow is 13 percent. The average firm size for firms that do grow is 2.89 employees. At this rate of employment growth, these firms would have an average of 8.68 employees after 10 years.

4.3 The Productive Heterogeneity of Small Firms

To examine the productive heterogeneity of MSMEs, we compute labor productivity defined as value added per worker. Value added is computed as the firm's average monthly sales minus the firms' average monthly costs of production. Because firms report average sales for each month of the year, we are able to take into account the seasonality of businesses. In the appendix, we show that this is quite important in that there is significant seasonal variation in revenues. Of course, an important issue with this type of data is measurement error. In recent work - de Mel, McKenzie and Woodruff (2008) examine the extent to which we can trust sales and expense data reported by small enterprises in developing countries. They find that sales are typically under-reported by up to 30% and that keeping written accounts significantly increases the accuracy of these measures. Since we know which firms in our dataset keep written accounts, we are able to check whether this holds in our data. We find that keeping written accounts is significantly positively correlated with firm level productivity. However, it could be that this difference is also a reflection of management capability and not just measurement error. Thus, we keep the full sample for our analysis and note that our estimates of labor productivity are likely to be understated. We also perform robustness tests by dropping firms that do not keep accounts - 67% of the firms in our sample - from our analysis.

We use kernel densities of the log of value added to examine the productive heterogeneity of MSMEs. Our analysis of the productive heterogeneity of firms in the MSME sector reveals two important features of these firms. First, there is significant overlap in productivity between 'formal' and 'informal' firms. This is shown in Figures 2a and 2b which plot the distribution of productivity for formal MSMEs (blue line) and the distribution of productivity for informal MSMEs (red line). We use two definitions of formality. In Figure 2a firms are considered formal if they are registered with BRELA Tanzania's business registration and licensing agency. In Figure 2b firms are considered formal if they have a tax identification number (Tax ID). The overlap in the distribution of productivity between formal and informal MSMEs is significant. Thus, it would be a mistake to classify all informal MSMEs as unproductive and all formal MSMEs as productive.

Second, Figure 3 reveals that a little over half of the firms in the MSME sector have labor productivity levels higher than the economy-wide average in agriculture. This is not surprising and is consistent with evidence presented in Section 2 of this paper where we show that average productivity in the sectors dominated by small firms is consistently higher than average productivity in agriculture. What is more surprising is the fact that 6.2% of the MSMEs – or 143,483 firms - have labor

productivity higher than economy-wide manufacturing labor productivity. These firms account for 30.7% of the total value-added generated by the MSME sector. This is important because it means that a good number of firms contribute to raising labor productivity in Tanzania's economy and it underscores the productive heterogeneity of the informal sector.

5. Using the MSME Survey to Identify Highly Productive MSMEs

Following Lewis (1979), we call MSMEs that are highly productive in-between firms. This terminology is meant to capture the idea that the characteristics of these firms place them somewhere in-between Tanzania's modern (most productive) and informal (least productive) firms. Because we want to get a sense for the number of firms and employees that fall into the in-between sector we classify firms according to whether or not they meet our definition of in-between. As a first cut, we include in the in-between group only firms with average annual labor productivity greater than economywide labor productivity in manufacturing. We then expand the sample of in-between firms by including all firms with annual average labor productivity greater than economywide labor productivity in trade services. Based on these definitions we begin by estimating the size of the in-between sector and then turn to examining observable correlates of in-between firms. It is worth emphasizing that we are thinking about this problem from the standpoint of a government with scarce resources with the goal of stimulating productive private sector investment in the face of many market imperfections including but not limited to firms' lack of access to collateral.

5.1 Estimating the Magnitude and Potential of the In-between Sector

In Table 8 we report the number of firms, the number of employees and average labor productivity for each of the two groups of in-between firms; firms with average labor productivity greater than economywide labor productivity in manufacturing and then trade services. Since economywide labor productivity in manufacturing is greater than in services, Group 2 includes the firms from Group 1. The manufacturing cutoff leaves us with 143,483 firms and 245,056 employees. Average labor productivity in these firms in USD 9,746 nearly 5 times the MSME average. Group 1 accounts for 5.7% of MSME firms, 6.18% of MSME employment and 30.7% of MSME value added. The trade services cutoff leaves us with 261,375 firms and 449,783 employees. Average labor productivity in these firms in USD 6,463 more than three times the MSME average. Group 2 accounts for 10.38% of MSME firms, 11.34% of MSME employment and 37.4% of MSME value added.

5.2 Observable Characteristics of In-between Firms

There is a large body of literature examining the determinants of firm level productivity in both developed and developing countries. Broadly speaking, these variables can be classified under the two sub-headings characteristics of business owners and characteristics of businesses. Business owner characteristics thought to influence firm success include socio-economic attributes, labor history, and owner's knowledge of business and management practices. Characteristics of businesses thought to influence firm level productivity include firm attributes such as size and age as well as access to infrastructure, technology and business services including finance. We have identified at least 70 such variables in the MSME dataset. A list of these variables along with a t-test of differences in the means of these variables between the in-between firms (defined using the manufacturing cutoff) and the rest of the firms is presented in Appendix Table 1a.

The results of the t-tests are mostly consistent with what we already know about the determinants of firm level productivity. For example, more educated business owners and business owners who are more knowledgeable about business and management practices run more productive firms. Female headed businesses are less productive and this turns out to be a function of the fact that female headed businesses tend to be run out of the household on a part-time basis. Firms that operate full time and firms that keep written accounts in a ledger are more productive. Access to infrastructure, technology and financial services are also correlated with firm level productivity. Apart from what we learn about firms in Tanzania, these results lend credence to our firm level measure of labor productivity.

Firm and owner characteristics that are readily observable and that can be verified will be most useful to policymakers designing programs targeted at small business growth. To this end and based on the t-tests presented in Appendix 1a, we identify 11 variables that differentiate in-between firms from the rest of small businesses and that could be used to guide policy. We use these variables as regressors in a probit specification where the dependent variable takes a value of one if the firm is in the in-between sector and zero otherwise. The estimated coefficients tell us something about the strength of these variables as predictors of firm performance. Of course this approach suffers from omitted variable bias and we have no intention of claiming causality. In fact, we are searching for variables that may indeed be correlated with the omitted variables that are costly to quantify and verify. One way to think about this exercise is as a search for sufficient statistics that can be used to capture several firm and owner attributes that would be costly or impossible to quantify and verify. The idea

is to use this information as a starting point for thinking about how to design an intervention targeted at the most promising firms.

Our estimating equation takes the follow form:

$$y = \alpha + \sum \beta_i x + \varepsilon \tag{1}$$

where y takes the value of 1 if the firm is in the in-between sector and zero otherwise. In equation (1) α is a constant, x is a matrix of covariates, β is a vector of coefficients to be estimated, and ε is an identically identified and distributed error term. Following the basic framework outlined in equation (1), we estimate three sets of results: (1) national level results which include both urban and rural businesses; (2) urban only results, and (3) rural only results. Sampling weights were applied in the estimation of all results and appropriate subpopulations were created for the estimation of urban and rural results. Marginal effects are reported together to facilitate interpretation. All standard errors are robust.

The results of estimating equation (1) are presented in table 9. The first three columns have as the dependent variable a binary variable that is equal to 1 if labor productivity of the business is greater than economywide average labor productivity in manufacturing and zero otherwise. The dependent variable for the last three columns was defined as 1 if labor productivity of the business is greater than economy trade-services labor productivity and zero otherwise. In the text below we use the terms manufacturing and trade as a way to indicate how the left-hand side variable was constructed.

We begin with the only variable that describes the owner of the business: gender. Negative and significant signs are observed across all specifications. Decreases in the probability of being in-between (under the manufacturing definition) range from 6.2 to almost 7 percent. Much larger decreases are observed for trade, from 9 percent in rural areas to 13 percent in urban settings. Obviously national policies would not be designed to discriminate against women. This result is important though because it does imply – as do the t-statistics reported in the appendix – that women are less likely to own successful businesses. As previously noted, this is partly because female headed businesses are more likely to be part-time and run out of the household both of which are negatively correlated with business productivity.

Operating on a full-time basis is positively correlated with being in the in-between sector in most cases. For manufacturing operating full-time increases the probability of being in-between by 4.3 and 6.3 percent respectively. Slightly larger increases were observed for trade (6.1 and 7.8 for national and rural areas respectively). Keeping accounts in a ledger increases the likelihood of being in the in-between sector by between 6.2 and 13.2 percent. Having paid workers has very little impact on the likelihood of being classified in the in-between sector.

One of the most significant predictors of firm performance is the number of daily customers it has; the question asks whether firms have at least 20 customers a day. This may be viewed as an imperfect proxy for sales revenue and firm size. Thus it is reassuring that this variable is strongly positively correlated with our measure of firm performance. Having 20 or more customers a day increases in the probability of being in the in-between sector by between 5.7-7.3 percent using the manufacturing cutoff and between 7.8-8.8 percent using the trade cutoff. Running the business from the household, on the other hand, has largely negative and significant effects particularly for national and rural areas.

Finally, infrastructure and interactions with the formal banking sector are also positively correlated with being in the in-between sector. Using electricity for the business increases the probability of being in the in-between sector by 7-11 when the manufacturing cutoff is used; greater increases are observed for businesses under the trade cut. The last variable captures whether or not business owners save money in a formal bank account. This too is positively correlated with being in the in-between sector.

In summary, firm performance is positively correlated with operating full-time, having an account ledger, using electricity to power the business and having a savings account in a formal bank. These results are robust to whether the manufacturing cutoff or the trade cutoff is used. To further check the robustness of these results, we re-run the regressions using only firms that keep accounts in a ledger on the grounds that the information provided by these firms is likely to be more accurate and less prone to measurement error. The results of this analysis are presented in Appendix Table 2a and indicate that although the magnitudes of the coefficients change slightly, the signs and significance of the coefficients remain largely intact.

5.3 Can Observable Characteristics Be Used for Targeting?

The most important obstacle to doing business reported by firms in the MSME sample is access to finance including working capital. This is not surprising and is consistent with the widespread popularity of microfinance and government programs designed for lending to small businesses at concessionary rates. Yet we have very little evidence to suggest that these programs actually enhance business performance. Instead, we do have evidence that well intended programs aimed at promoting small business growth have had un-intended negative consequences.¹¹ It is likely that these disappointing results are at least partially attributable to an inability or an unwillingness to target products designed to enhance business success at capable firms. Of course targeting can be operationally and politically difficult. But we agree with Schoar (2010) who writes that unless policies designed to enhance small firm performance take into account small firm heterogeneity, they are likely to fail.

There is of course no blueprint for successful targeting but in closing we consider some options based on the results of the analysis presented in this section. The results that seem potentially useful to us are the findings on keeping written accounts and formal savings accounts. In lieu of collateral, lenders in Tanzania could require written accounts on a quarterly or bi-annual basis as a pre-condition for lending. Presumably if the accounts were audited by an independent third party, they would inform lenders not just about the quality of the borrower but also about the size and terms of the loan that any given business could carry with minimal risk of default. An advantage to this type of targeting is that it could in principle be open to all MSMEs but would likely prove too costly for MSMEs with poor business performance. The information associated with formal savings accounts might also be used for targeting. For example, monitoring deposits and withdrawals in a formal savings accounts would allow lenders to learn about the financial habits of potential borrowers. A disadvantage of this approach is that it would likely tie borrowers to the banks in which they save limiting competition.

¹¹ See for example Martin et al (2015) and De Paula et al (2011).

5.4 How Much Could Small Firms Contribute to Labor Productivity Growth?

To think about how much the informal sector could contribute to labor productivity growth, we rely on the framework laid out in Rodrik (2014) that separates labor productivity growth into the components due to improvements in fundamentals, convergence in formal manufacturing and structural change. Since we have no way of predicting how improvements in fundamentals might impact the productivity of firms in the informal sector, we focus exclusively on the structural change channel. In this framework, the contribution of the informal sector to labor productivity growth is the difference in relative productivities between the informal sector (I) and the traditional sector (T) multiplied by the change in the employment share in the informal sector $d\alpha_I$. Formally this may be written as in equation (2) where \hat{y} stands for growth in output per worker, π_I is relative labor productivity in the informal sector and π_T is relative labor productivity in the traditional sector.

$$\hat{y} = (\pi_I - \pi_T)d\alpha_I \tag{2}$$

This equation makes it clear that informal firms will contribute to economywide labor productivity growth when the relative productivity of informal firms is greater than relative productivity in the traditional sector and when employment in the informal sector expands. Using equation (2) we estimate that the overall contribution of MSMEs to labor productivity growth in Tanzania between 2002 and 2012 was roughly .57 percentage points or $(.81-.41)*1.39$. Firms in the in-between sector defined by the manufacturing cutoff accounted for 98% of this increase in labor productivity growth or $(4.7-.41)*.13$. There are two obvious ways in which firms in the in-between sector could contribute more to economywide labor productivity growth. First, they could hire more workers and second they could raise their relative productivity.

Increasing the share of workers in the in-between sector from .13 percent to .26 percent of total employment while holding relative productivities constant would increase the in-between sectors' contribution to labor productivity by 1.12 percentage points. This would be equivalent to getting each firm in the in-between sector to hire one additional full time worker. This does not seem out of the realm of possibility but there is no guarantee that productivity would remain constant if more workers were hired. Doubling labor productivity in the in-between sector while maintaining the past growth rate of the employment in the in-between sector of .13 percent per annum would raise the in-between sectors contribution to annual labor productivity growth in the economy to 1.17 percentage points.

This is pretty much equivalent to graduating all of the in-between firms to formal status which at least on the face of it seems like a much more difficult task.

These numbers are not meant to be accurate predictions of what is to come. Rather they are intended to give us a sense for the potential of the in-between firms to contribute to economywide labor productivity growth. The percentage points reported here are not trivial in following sense. Tanzania's formal economy contributed around 1.5 percentage points to labor productivity growth between 2002 and 2012. Our calculations suggest that in-between firms could contribute meaningfully to economywide labor productivity growth. But it is unlikely that this will happen without a targeted effort by the private and/or public sector. Given the size of Tanzania's informal economy, it seems to us that prioritizing labor productivity growth in the informal sector would be worthwhile.

6. Conclusion

We have shown in this paper that at 4.1% per annum, labor productivity in Tanzania has grown more rapidly over the past 12 years than at any other time in recent history. We have also shown that employment growth has kept up with population growth at roughly 2.5 percent per annum. However, the bulk of this employment growth—almost 90%— has occurred in the non-agricultural sector. In addition, 73% of employment growth in the non-agricultural has occurred in the informal sector. We argue that because employment growth in the informal sector has been more rapid than employment growth in the formal sector – and there is no indication that this is likely to change any time soon - more attention needs to be paid to firms in the informal sector.

We use Tanzania's first nationally representative survey of micro, small and medium sized enterprises (MSMEs) to explore the nature of these businesses and their contribution to economywide labor productivity growth. We find that these firms operate primarily in the manufacturing and trade services sectors and that they are distributed across regions roughly in proportion to population density. We find little difference in labor productivity between firms in rural and urban areas. And we find that roughly half of MSME business owners would not quit their businesses for a full time salaried position.

We show that the informal sector contributed roughly half a percentage point to economywide labor productivity growth in Tanzania between 2002 and 2012. Virtually all of the labor productivity growth contributed by informal firms came from a small subset of firms we call the in-between firms. We consider attributes of the in-between firms that could be used for targeting financial and business

services to firms with the potential to grow. We find two salient characteristics of firms in the in-between sector that might lend themselves to targeting. Firms in the in-between sector are more likely to keep written accounts in a ledger and the owners of firms in the in-between sector are more likely to save money in a formal bank account. Both of these attributes could be used to target MSMEs with growth potential.

References

- African Development Bank. 2013. "Recognizing Africa's Informal Sector." Retrieved November 30, 2015, from <http://www.afdb.org/en/blogs/afdb-championing-inclusive-growth-across-africa/post/recognizing-africas-informal-sector-11645/>
- Banerjee, Abhijit, Abhijit Vinayak Banerjee, and Esther Duflo. 2011. *Poor economics: A radical rethinking of the way to fight global poverty*. PublicAffairs.
- Banerjee, Abhijit V., and Esther Duflo. 2007. "The economic lives of the poor." *The journal of economic perspectives: a journal of the American Economic Association* 21(1): 141.
- Banerjee, Abhijit V., Emily Breza, Esther Duflo and Cynthia Kinnan. 2015. "Do credit constraints limit entrepreneurship? Heterogeneity in the returns to microfinance." Working Paper. July 2015. Retrieved August 15, 2015 from <http://conference.nber.org/confer/2015/SI2015/PRPD/Kinnan.pdf>
- De Mel, Suresh, David McKenzie, and Christopher Woodruff. 2008. "Returns to Capital in Microenterprises: Evidence from a Field Experiment." *The Quarterly Journal of Economics* 123(4): 1329-1372.
- De Mel, S., McKenzie, D.J. and Woodruff, C., 2009. "Measuring microenterprise profits: Must we ask how the sausage is made?" *Journal of development Economics*, 88(1), pp.19-31.
- De Paula, Aureo and Jose Scheinkman. 2011. "The Informal Sector: An Equilibrium Model and Some Empirical Evidence from Brazil." *Review of Income and Wealth* 57(s1), s8-s26.
- Fafchamps, Marcel, David McKenzie, Simon Quinn, and Christopher Woodruff. 2014. "When is Capital Enough to Get Female Enterprises Growing? Evidence from a Randomized Experiment in Ghana." *Journal of Development Economics* (xx).
- Fafchamps, M. and Woodruff, C., 2016. "Identifying gazelles: expert panels vs. surveys as a means to identify firms with rapid growth potential" *The World Bank Economic Review*, p.lhw026.
- Financial Sector Deepening Trust. 2012. "National Baseline Survey Report for Micro, Small and Medium Enterprises in Tanzania." Retrieved from <http://www.fsdt.or.tz/data/msme-baseline-survey/>
- Grimm, Michael, Jens Krüger, and Jann Lay. 2011. "Barriers to Entry and Returns to Capital in Informal Activities: Evidence from Sub-Saharan Africa." *Review of Income and Wealth*. 57(1): 27-53.
- Grimm, M., Knorringa, P. and Lay, J., 2012. "Constrained gazelles: High potentials in West Africa's informal economy" *World Development*, 40(7), pp.1352-1368.
- Lewis, W. Arthur. 1979. "The Dual Economy Revisited." *The Manchester School* 47(3): 211-29.
- Li, Yue and Martin Rama. 2015. "Firm Dynamics, Productivity Growth and Job Creation in Developing Countries: The Role of Micro- and Small Enterprises." *The World Bank Research Observer*, Oxford University Press.

- Martin, Leslie A., Shanti Nataraj and Ann Harrison. 2015. "In with the big, out with the small: Removing small-scale reservations in India." NBER Working Paper, 19942. Retrieved July 24, 2015, from <http://www.nber.org/papers/w19942>
- McKenzie, David J. 2015. "Identifying and spurring high-growth entrepreneurship: experimental evidence from a business plan competition." World Bank Policy Research Working Paper 7391 (2015).
- McKenzie, David, and Christopher Woodruff. 2008. "Experimental Evidence on Returns to Capital and Access to Finance in Mexico." *World Bank Economic Review*. 22(3): 457-482.
- McMillan, M., & Rodrik, D. 2011. "Globalization, Structural Change and Productivity Growth." NBER Working Paper, 17143. Retrieved November 30, 2015, from <http://www.nber.org/papers/w17143>
- Ministry of Industry and Trade, Tanzania. 2012. "Annual Survey of Industrial Production 2009: Statistical Report." Dar es Salaam, Tanzania, May 2012
- Ministry of Industry and Trade, Tanzania. 2010. "Annual Survey of Industrial Production and Performance 2008: Analytical Report." Dar es Salaam, Tanzania, September 2010
- National Bureau of Statistics, Ministry of Finance, Tanzania. 2014a. "National Accounts of Tanzania Mainland 2001-2013," Dar es Salaam, Tanzania, December 2014.
- National Bureau of Statistics, Ministry of Finance, Tanzania. 2014b. "Revised National Accounts Estimates for Tanzania Mainland, Base Year, 2007" Dar es Salaam, Tanzania, November 2014.
- National Bureau of Statistics, Ministry of Finance, Tanzania. 2014c. "Formal Sector Employment and Earnings Survey: Analytical Report 2013," Dar es Salaam, Tanzania, August 2014.
- National Bureau of Statistics, Ministry of Finance, and Office of Chief Government Statistician, Ministry of State, President's Office, State House and Good Governance, Tanzania. 2014d. "Tanzania 2012 Census: Basic Demographic and Socio-Economic Profile," Dar es Salaam and Zanzibar, Tanzania, April 2014.
- National Bureau of Statistics, Ministry of Planning, Economy and Empowerment, Tanzania. 2007. "Analytic Report for Employment and Earnings Survey 2002." Dar es Salaam, Tanzania, July 2007.
- National Bureau of Statistics, Ministry of Planning, Economy and Empowerment, Tanzania. 2006. "Tanzania 2002 Census: Analytical Report, Volume X," Dar es Salaam, Tanzania, August 2006.
- La Porta, R., and Shleifer, A. 2011. "The Unofficial Economy in Africa." NBER Working Paper, 16821. Retrieved November 30, 2015, from <http://www.nber.org/papers/w16821>
- La Porta, R., and Shleifer, A. 2014. "Informality and Development." NBER Working Paper, 20205. Retrieved November 30, 2015, from <http://www.nber.org/papers/w20205>
- Rodrik, Dani. 2014. "The past, present, and future of economic growth." *Challenge* 57(3): 5-39.

Wangwe, Samuel and Mmari, Donald. 2016. "Managing the Transition from Informal to Formal Enterprises," REPOA, Tanzania. February.

World Bank. 2016. World Development Indicators. An online database.

Schoar, Antoinette. 2010. "The divide between subsistence and transformational entrepreneurship." *Innovation Policy and the Economy, Volume 10*. University of Chicago Press, 57-81.

Tables and Figures

Table 1: Tanzania's economy-wide labor productivity growth decomposition (2002-2012)

	Value-added per worker (constant 2005 TZS in billion)		Sector labor productivity growth rate	Sector GDP share		Sector labor share		Economywide labor productivity growth decomposition (2002-12 annual, %)		
	2002	2012	(2002-12 annual %)	2002	2012	2002	2012	Within	Between	Total
Agriculture	351	509	3.8	34.2	27.0	81.7	65.8	1.28	-0.81	0.48
Mining	4,057	1,581	-9.0	2.4	3.3	0.5	2.6	-0.12	0.33	0.20
Manufacturing	3,575	3,706	0.4	8.2	9.6	1.8	3.2	0.02	0.51	0.53
Utilities	6,467	1,792	-12.0	2.3	1.9	0.3	1.3	-0.14	0.18	0.04
Construction	5,560	5,119	-0.8	7.3	9.9	1.0	2.4	-0.04	0.70	0.66
Trade services	1,607	1,760	0.9	14.9	16.0	7.5	11.3	0.11	0.66	0.77
Transport services	5,968	5,442	-0.9	6.5	7.5	0.8	1.7	-0.04	0.48	0.44
Business services	35,298	20,860	-5.1	12.1	13.5	0.2	0.8	-0.29	1.23	0.94
Gov't services	3,178	3,762	1.7	11.2	10.7	4.1	3.5	0.24	-0.22	0.02
Personal services	213	114	-6.0	0.8	0.7	2.1	7.4	-0.02	0.06	0.04
Total private economy	761	1,148	4.2	88.8	89.3	95.9	96.5	0.76	3.33	4.09
Total	832	1,240	4.1	100	100	100	100	1.0	3.1	4.1
Contribution to economywide labor productivity growth (total economy's labor productivity growth in 2002-2012 = 100)										
Agriculture								31.2	-19.6	11.6
Mining								-3.0	7.9	4.9
Manufacturing								0.6	12.4	12.9
Utilities								-3.4	4.3	0.9
Construction								-1.1	17.1	16.0
Trade services								2.8	15.9	18.7
Transport services								-1.0	11.7	10.7
Business services								-7.0	29.8	22.8
Gov't services								5.8	-5.2	0.6
Personal services								-0.5	1.4	0.9
Total								24.3	75.7	100

Source: Authors' calculation based on the data of national accounts and Census 2002 and 2012 drawn from Tanzanian government documents ((NBS, 2006, 2014a, 2014b, and 2014d)

Table 2. Contribution to new employment by sector, formal and informal 2002-2012

	Total		Formal		Informal	
	Number of net increase	Share in total net increase	Number of net increase	Share in total net increase	Number of net increase	Share in total net increase
Agriculture	446,677	11.2	-3,865	-0.1	450,542	11.3
Mining	404,212	10.1	9,021	0.2	395,192	9.9
Manufacturing	313,882	7.8	103,049	2.6	210,833	5.3
Utilities	194,960	4.9	194,960	4.9	-	0.0
Construction	281,864	7.0	21,185	0.5	260,679	6.5
Trade services	966,807	24.2	1,304	0.0	965,503	24.1
Transport services	182,383	4.6	18,497	0.5	163,886	4.1
Business services	105,635	2.6	56,924	1.4	48,711	1.2
Public sector	224,579	5.6	224,579	5.6		0.0
Personal services	881,289	22.0	0	0.0	881,289	22.0
Total private non-agriculture	3,331,032	83.2	404,940	10.1	2,926,093	73.1
Total private economy	3,375,978	84.4	845,077	21.1	2,530,901	63.2
Total non-agriculture	3,555,611	88.8	629,519	15.7	2,926,093	73.1

Source: Authors calculation based on data from the Formal Employment and Earnings Survey and the Census 2002 and 2012 (NBS, 2006, 2007, 2014c, and 2014d)

Table 3. MSME Summary Statistics

Names of variables	Observations	Value unit or range	Mean	S.D.	Min	Max
<u>Business Characteristics</u>						
Number of employees per firm	5,653	Person	1.48	1.652	1	80
Number of full-time employees per firm	5,653	Person	1.286	0.958	0	31
Annual employment growth	5,653	[-.09,.25]	0.022	0.054	-0.09	0.25
% of firms registered with Brella	5,653	[0,1]	0.03	0.171	0	1
% of firms with tax ID	5,653	[0,1]	0.053	0.224	0	1
% of firms with business run out of home	5,653	[0,1]	0.515	0.5	0	1
% of firms in the rural area	5,653		0.741	0.438	0	1
Average monthly value added per firm	5,653	1,000 TZS	328	367,939	0.50	2,538
Average monthly sales per firm	5,653	1,000 TZS	461	434,142	3.00	2,600
Firm's age	5,595	Year	6.333	6.022	1	35
% of firms with business as full-time	5,653	[0,1]	0.799	0.401	0	1
Keeps accounts in ledger	5,653	[0,1]	0.327	0.327	0	1
Hires paid workers	5,653	[0,1]	0.101	0.301	0	1
>20 customers per day	5,653	[0,1]	0.289	0.453	0	1
Firms powers business with electricity	5,653	[0,1]	0.162	0.368	0	1
<u>Owner/household characteristics</u>						
Age of owner	5,653	Year	37	11	16	91
Whether owner is female	5,653	[0,1]	0.52	0.50	0	1
% of firms households that are not poor	5,653	[0,1]	0.45	0.50	0	1
% of firms households that are moderately poor	5,653	[0,1]	0.35	0.48	0	1
% of firms households that are very poor	5,653	[0,1]	0.20	0.40	0	1
% firms with business as main source of income	5,653	[0,1]	0.40	0.49	0	1
% firms with farming as main source of income	5,653	[0,1]	0.19	0.39	0	1
% firms with business as only source of income	5,653	[0,1]	0.33	0.47	0	1
Owner saves in formal bank account	5,653	[0,1]	0.08	0.27	0	1

Notes: Brella is Tanzania's Business Registration and Licensing Agency opened in 1999. Measures of poverty were computed at the household level and using Tanzania's LSMS. TZS denote Tanzanian Shillings. Source: Authors calculations using the MSME Survey 2010 (Financial Sector Deepening Trust, 2012).

Table 4. Sectoral distribution of MSME firms

	Number in sample	% in total
Extraction	21	0.4
Manufacturing	975	17.2
Grain milling	95	1.7
Beverage	466	8.2
Textile	189	3.3
Wood	30	0.3
Building materials	59	1.0
Furniture	89	1.6
Trade services	4,479	79.2
Wholesale	145	2.6
Retail with shops	865	15.3
Retail with stalls	1,376	24.3
Retail on street	402	7.1
Beverage services	441	7.8
Food services	1,250	22.1
Transport	17	0.3
Business services	31	0.5
Repair and personal services	130	2.3
Total	5,653	

Source: Authors' calculation using MSME survey 2010 (Financial Sector Deepening Trust, 2012)

Table 5: MSME contribution to national employment (1,000 person)

	National economy (Census 2012) (1)	Formal economy (FEES 2012) (2)	Census - FEES (3) = (1)- (2)	MSMEs (MSME 2010) (4)
Manufacturing	585	260	325	648
Trade services	2,067	240	1,827	3,104
Wholesale and Retail Trade	1,738	119	1,619	1,893
<i>Wholesale</i>	110			90
<i>Service Workers Shop and Stall Sales Workers</i>	1,061			1,586
<i>Street Vendors and Related Workers</i>	567			217
Hotel, restaurants and food services	329	119	210	1,173
Transport	311	62	249	
Transport and Storage	238	43	195	
Information and Communication	73	19	54	
Construction	439	45	394	
Other private services	1,349		1,349	178
Other private non-agriculture	861	205	655	20
Total private non-agriculture	5,612	812	4,800	3,912

Note: We applied individual weights in the calculation, which is different from the weights applied in the National Baseline Survey Report for MSME (FSDT 2012). Because of this, and also because some firms did not have ISIC code in the data and hence are not included in our calculation, the total MSME employment number of 4 million in this table is lower than that in FSDT (2012) in which is around 5 million.

Sources: Authors calculation using Census 2012 report (NBS, 2014d), FEES report (NBS, 2014c), and MSME survey data (Financial Sector Deepening Trust, 2012).

Table 6: MSME contribution to national and sectoral GDP (in current billion TZS)

	National economy	Formal economy		MSME
	(National account, 2010)	(ASIP 2008)	(ASIP 2009)	(MSME 2010)
Total Manufacturing	3,022			538
Beverage		183	499	164
Food processing		26	494	65
Textile		842	117	166
Wood products excluding furniture		1,108	5	18
Furniture		207	21	53
Building related materials		12	252	71
Trade services	5,163			5,141
Wholesale and Retail Trade	4,442			3,941
Wholesale				394
Retail with shops				3,151
Street vendors				396
Hotel and Restaurants	721			1,200
Transport	3,689			-
Transport and Storage	2,537			-
Information and Communication	1,152			
Construction	3,146			
Other private services	5,042			196
Other private non-agriculture	3,175			10
Total private non-agriculture	23,237			5,884
Total economy	43,571			

Note: Value-added calculation is extremely difficult for MSME survey given that many small firms did not keep an account. The methodology for such calculation is documented in Appendix.

Sources: Authors calculation using data of National accounts after rebasing (NSB, 2014b), ASIP (Ministry of Industry and Trade, 2010 and 2012) and the MSME survey 2010 (Financial Sector Deepening Trust, 2012)

Table 7: Business owner motivations and job satisfaction (%)

Reasons for business choice	Share of Business Owners
I saw a market opportunity	47.63
My capital could only finance this business	42.79
I had previous experience in this line	17.05
Friends/relatives are in this line of business	16.42
Job Satisfaction	Share of Business Owners
If you were offered a full-time salary paying job, would you take it? (% reporting yes)	46.57
Who would you rather work for?	
Government	63.92
Large private company	23.99

Source: Authors calculation using the MSME survey data 2010 (Financial Sector Deepening Trust, 2012)

Table 8: Definitions of Groups of In-between Firms

		# of firms	# of employees	VA per worker (\$US)	# of employees per firm	
Group 1	Firms with labor productivity > economy-wide manufacturing labor productivity	143,483	245,056	9,746	1.71	
Group 2	Firms with labor productivity > economy-wide trade services labor productivity	261,375	449,783	6,463	1.72	
Share of MSME total					Ratio to MSME average	
		# of firms	# of employees	Total value-added	Lprody	Firm size
Group 1	Firms with labor productivity > economy-wide manufacturing labor productivity	5.70	6.18	30.7	4.98	1.08
Group 2	Firms with labor productivity > economy-wide trade service labor productivity	10.38	11.34	37.4	3.30	1.09

Note: We consider only firms that keep written accounts; Group 1 is included in Group 2.

Source: Authors' calculation using MSME survey data 2010 (Financial Sector Deepening Trust, 2012)

Table 9: Marginal effects of probit estimations using two definitions of in-between firms

Variables	Manufacturing			Trade		
	National	Urban	Rural	National	Urban	Rural
Whether business is urban	0.0147 (0.0170)			0.0284 (0.0243)		
Female	-0.0697*** (0.0158)	-0.0629** (0.0283)	-0.0691*** (0.0165)	-0.115*** (0.0233)	-0.134*** (0.0417)	-0.0955*** (0.0221)
Firm operates full time	0.0431** (0.0200)	0.00751 (0.0303)	0.0632** (0.0243)	0.0617** (0.0249)	0.0242 (0.0418)	0.0778*** (0.0265)
Firm keeps account ledger	0.0620*** (0.0145)	0.0365 (0.0272)	0.0823*** (0.0131)	0.125*** (0.0224)	0.116*** (0.0384)	0.132*** (0.0202)
Firm has paid workers	-0.0442* (0.0224)	-0.0322 (0.0321)	-0.0539* (0.0275)	-0.0134 (0.0254)	0.0260 (0.0335)	-0.0685** (0.0268)
Firm has tax id	0.00459 (0.0302)	-0.00158 (0.0486)	0.0226 (0.0367)	0.0222 (0.0382)	-0.00210 (0.0575)	0.0489 (0.0473)
Firm has more than 20 customer daily	0.0573*** (0.0149)	0.0397 (0.0283)	0.0739*** (0.0126)	0.0850*** (0.0180)	0.0780** (0.0299)	0.0879*** (0.0197)
Whether firm is registered with brella	-0.0404 (0.0334)	-0.0648 (0.0541)	-0.0347 (0.0381)	-0.0274 (0.0450)	-0.0304 (0.0780)	-0.0204 (0.0440)
Whether business is run out of the household	-0.0557*** (0.0141)	-0.0941*** (0.0247)	-0.0236 (0.0159)	-0.0725*** (0.0150)	-0.120*** (0.0277)	-0.0244 (0.0175)
Whether electricity is used to power business	0.0777*** (0.0212)	0.113*** (0.0290)	0.0248 (0.0217)	0.113*** (0.0281)	0.119*** (0.0363)	0.107*** (0.0311)
Whether business saves in a formal bank account	0.0646*** (0.0198)	0.0732** (0.0287)	0.0549* (0.0303)	0.0786*** (0.0294)	0.0857** (0.0420)	0.0797** (0.0387)
Observations	5,599	5,593	5,601	5,599	5,607	5,601

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

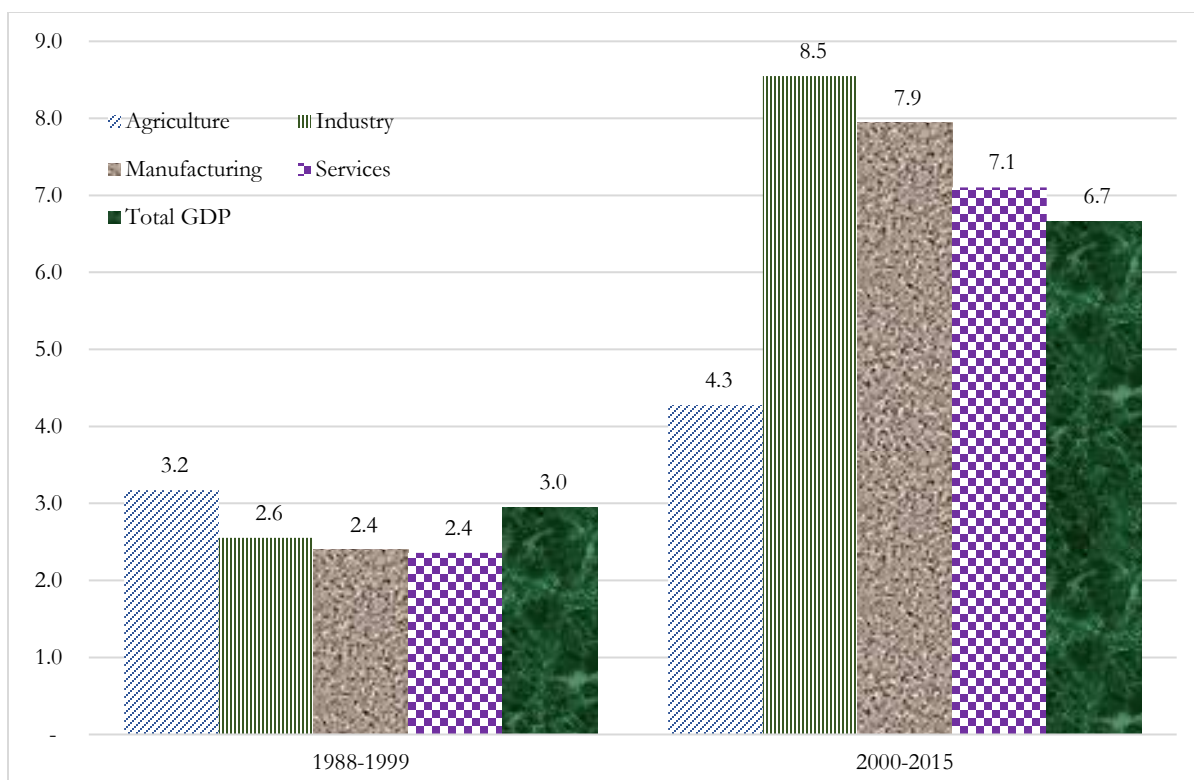
Notes: 1- Regional and industry fixed effects were included in all regressions but are not reported here.

2- 740 firms were classified as in-between according to the manufacturing cut

3- 1509 firms were classified as in-between according to the trade cut

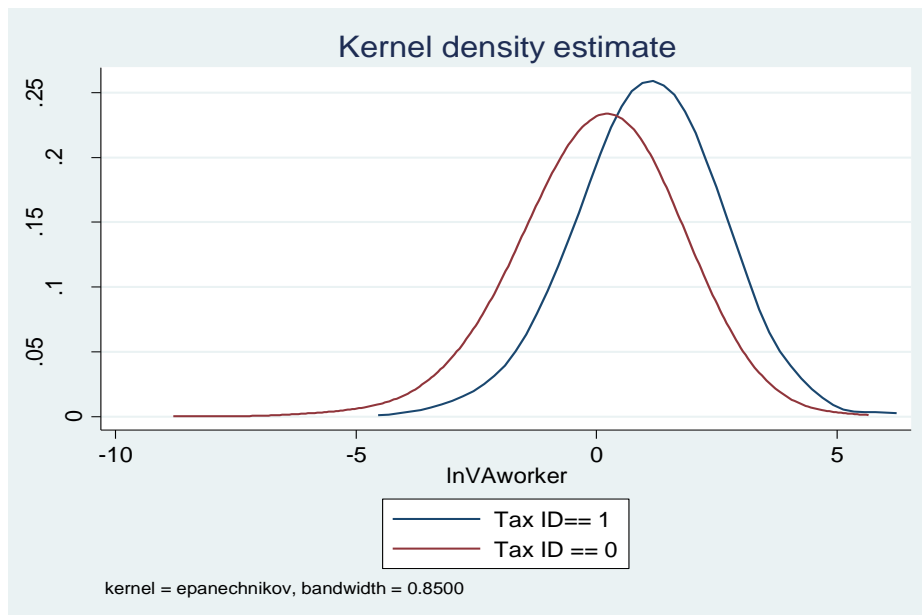
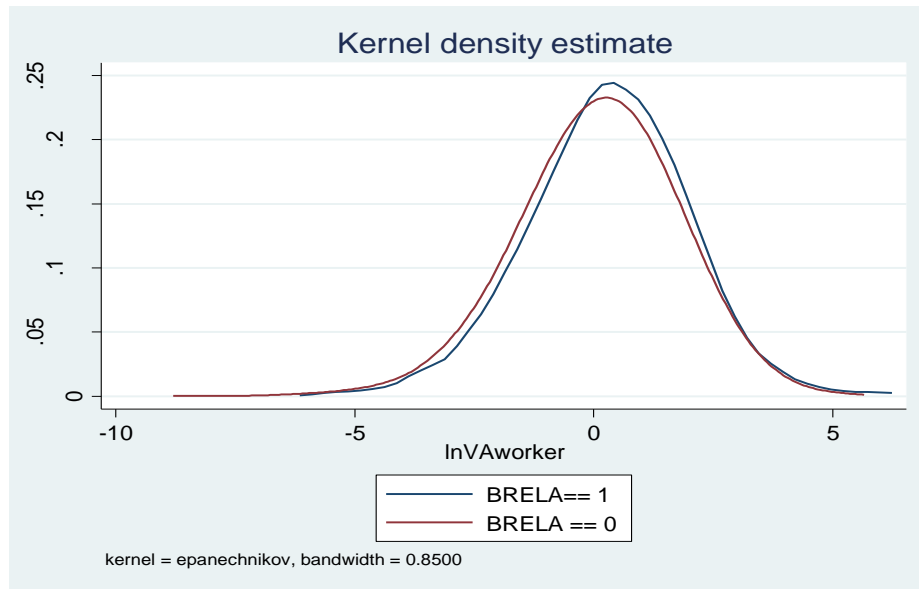
Source: Authors' estimation using MSME survey data 2010 (Financial Sector Deepening Trust, 2012)

Figure 1: GDP and sectoral GDP annual growth rate in 1988-1999 and 2000-2015 (%)



Source: Authors' calculation using data of WDI (World Bank, 2016). The sector-wise GDP annual growth uses the period of 1990-1999 due to data limitation.

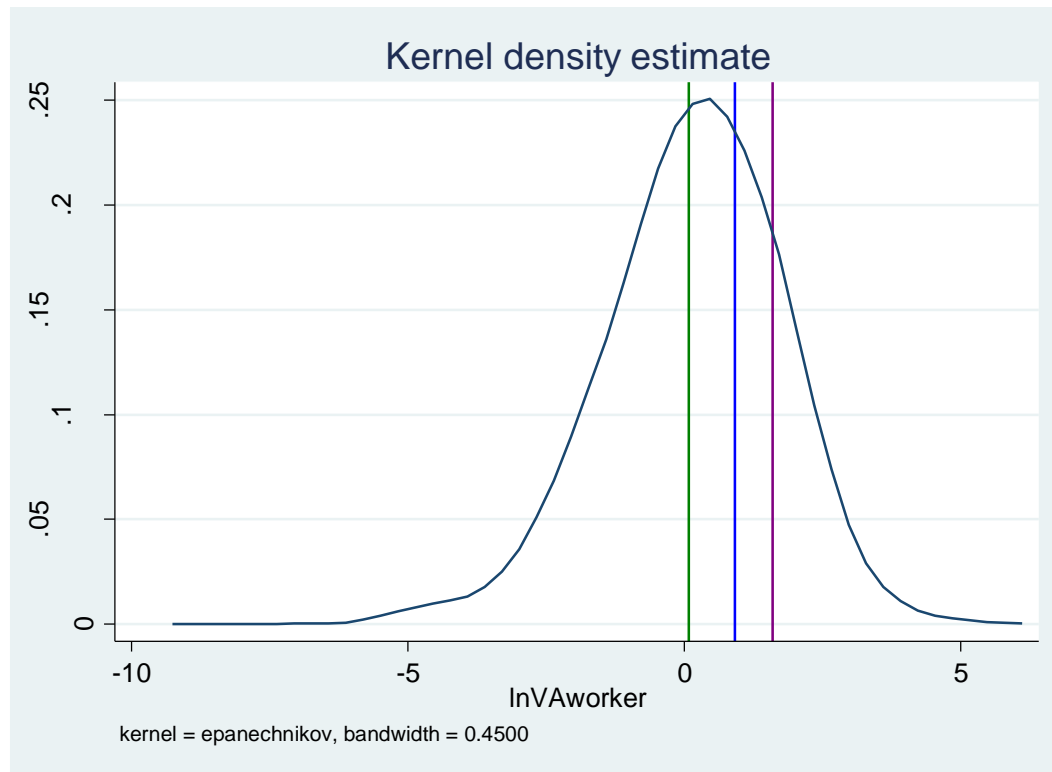
Figure 2: Comparison of the Distribution of Annual Value Added Per Worker between Formal and Informal Firms in the MSME survey



Note: BRELA is Tanzania’s Business Registration and Licensing Agency. Only 3.7% of MSMEs are registered with BRELA. When we take the log of value added per worker, firms with negative value added per worker are dropped. Firms with negative value added represent 5% of the sample. We tried a variety of alternative representations of the data and taking the log of annual value added made the graphs easiest to read. Visually, including firms with negative value added would shift the densities to the left slightly. For this reason, we don’t use these densities to estimate the actual share of the distribution that falls between any two values. This type of calculation is done using the actual data.

Source: Authors’ estimation using the MSME survey data 2010 (Financial Sector Deepening Trust, 2012)

Figure 3: Comparison of the Distribution of Annual Value Added Per Worker to Economy-wide Productivity



Notes: Vertical lines are the log of average economy-wide productivity in agriculture (green), trade services (blue) and manufacturing (purple). Annual average value added per worker in 2010 in agriculture is 1.08 million TZSH, in trade services 2.49 million TZSH and in manufacturing 5.16 million TZSH. At a nominal exchange rate of .TZSH 1,428.57 to 1 USD, these numbers work out to 756 USD, 1,743 USD and 3,612 USD respectively. When we take the log of value added per worker, firms with negative value added are dropped. Firms with negative value added represent 5% of the sample. We tried a variety of alternative representations of the data and taking the log of annual value added made the graphs easiest to read. Visually, including firms with negative value added would shift the densities to the left slightly. For this reason, we don't use these densities to estimate the actual share of the distribution that falls between any two values. This type of calculation is done using the actual data.

Source: Authors' estimation using the MSME survey data 2010 (Financial Sector Deepening Trust, 2012)

Appendix

Table 1a: T-tests comparing the means of selected individual and business traits using the manufacturing cut.

	Mean (Not In-Between Firms)	Mean (In- Between Firms)	P-values
Business Owner Characteristics			
Socio-economic characteristics			
Education (Above Primary Level)	1.49	1.85	0.00
Marital Status	0.90	0.87	0.21
Owner's Age	36.73	35.14	0.01
Female	0.60	0.39	0.00
Owner is Not Poor	0.49	0.61	0.00
Owner would leave business for a full salary	0.48	0.39	0.01
Owner is Moderately Poor	0.33	0.28	0.04
Owner has started Other Businesses	1.15	1.18	0.26
Main Source of Income is the Business	0.10	0.11	0.46
Main Source of Income is Farming	0.06	0.10	0.08
Owner's business practices/attitudes towards business			
Owner is Member of Business Savings Club	0.37	0.42	0.22
Owner is Member of a Business Association	0.17	0.10	0.00
Owner has taken Expert Advice	0.02	0.05	0.10
Saw Business as a Market Opportunity	0.45	0.52	0.01
Views Business as Growing	0.54	0.73	0.00
Owner's knowledge about business practices			
Owner has Formal Bank Account	0.06	0.15	0.00
Owner uses Debit Card for Business	0.05	0.12	0.00
Owner Saves Money in a Bank Account	0.07	0.15	0.00
Owner does not Believe in Interest	0.21	0.14	0.00
Owner uses Profits to Expand Business	0.17	0.22	0.05
Owner uses Profits to Buy Stocks in Advance	0.41	0.50	0.00
Owner uses Profits to Invest in Business	0.17	0.22	0.05
Owner uses Profits to Invest in Buildings and land	0.06	0.10	0.01
Labor History			
Previously Unemployed	0.07	0.09	0.25
Previously a Home Maker	0.22	0.11	0.00
Previously worked in the Education Sector	0.04	0.05	0.70
Previously Employed in Large Private Enterprise	0.04	0.09	0.01
Previously Employed in Similar Sized Private Enterprise	0.02	0.03	0.19
Previously Ran a Similar Sized Enterprise	0.14	0.15	0.75
Previously a Civil Servant	0.02	0.04	0.20
Previously engaged in Farming/Rearing of Livestock	0.38	0.37	0.53
Owner was Trained on Previous Job	0.04	0.06	0.34
Owner was Trained in a Course	0.02	0.02	0.41

Owner's Access to Financial Services			
Owner has Borrowed for Business	0.18	0.23	0.05
Firm has Received Financial Services	0.05	0.10	0.01
Owner uses a Sacco	0.02	0.03	0.15
Owner regularly Sends & Receives Money for Business	0.14	0.23	0.00
Business Characteristics			
Firm Characteristics			
Firm Age	6.39	6.77	0.32
Business runs Full Time	0.78	0.88	0.00
Business is run out of the Household	0.50	0.37	0.00
Firm has Market Access	0.68	0.73	0.08
Business near Similar Businesses	0.73	0.82	0.00
Firm keeps Written Accounts in a Ledger	0.29	0.52	0.00
Firm maintains Business Budget	0.07	0.07	0.86
Firm started with a Business Plan	0.01	0.02	0.08
Firm has some License	0.15	0.31	0.00
Firm pays Income Tax	0.04	0.09	0.00
Firm Advertises	0.02	0.02	0.73
Firm pays Workers in Cash	0.13	0.12	0.89
Workers received Technical Training	0.19	0.12	0.00
Workforce Increased for the Business in the Past Year	0.08	0.07	0.42
Firm Has Regional customers	0.19	0.31	0.00
Number of Daily Customers is More than 20	0.26	0.42	0.00
Firm's Suppliers are Individuals	0.48	0.41	0.03
Firm's Suppliers are Small Traders	0.54	0.51	0.45
Firm's Suppliers are Nationwide	0.04	0.09	0.00
Business Registered with Brela	0.04	0.04	0.96
Business Has a Tax ID	0.04	0.11	0.00
Business Gets Inputs on Credit	0.09	0.12	0.07
Business has Rental Agreement for B.Premises	0.09	0.15	0.00
Infrastructure and Technology			
Firm Owner has a Mobile Phone	0.54	0.75	0.00
Owner uses Mobile to Conduct Business	0.42	0.70	0.00
Firm Owner has a Calculator	0.13	0.29	0.00
Business has Office Equipment	0.17	0.19	0.38
Business Owns a Cooling Facility	0.04	0.10	0.00
Firm has Received Legal Services	0.01	0.02	0.13
Firm has Received Technical Services	0.04	0.04	0.67
Firm Has Security Services	0.16	0.18	0.48
Firm has Received Financial Services	0.05	0.10	0.01
Business uses Electricity to Light Business	0.17	0.32	0.00

Note: 740 sampled firms were classified as in-between according to the manufacturing cut

Source: Authors' estimation using the MSME survey data 2010 (Financial Sector Deepening Trust, 2012)

Table 2a: Marginal effects of the probit estimations using only firms that keep an accounts ledger

Variables	Manufacturing			Trade		
	National	Urban	Rural	National	Urban	Rural
Whether business is urban	0.00317 (0.0134)			0.00679 (0.0185)		
Female	-0.0342*** (0.0118)	0.00522 (0.0209)	-0.0631*** (0.0123)	-0.0590*** (0.0138)	-0.0133 (0.0236)	-0.0830*** (0.0143)
Firm operates full time	0.0648*** (0.0170)	0.0713** (0.0316)	0.0592*** (0.0186)	0.0589*** (0.0193)	0.0701** (0.0347)	0.0494** (0.0210)
Firm has paid workers	-0.0268* (0.0151)	-0.0371 (0.0233)	-0.00740 (0.0172)	0.00231 (0.0258)	0.0139 (0.0415)	-0.00885 (0.0198)
Firm has tax id	0.0332 (0.0210)	0.0289 (0.0312)	0.0582** (0.0285)	0.0426 (0.0279)	0.0297 (0.0387)	0.0618* (0.0343)
Firm has more than 20 customer daily	0.0518*** (0.0108)	0.0581*** (0.0189)	0.0519*** (0.0117)	0.0740*** (0.0144)	0.0888*** (0.0255)	0.0677*** (0.0164)
Whether firm is registered with brella	-0.00220 (0.0293)	0.0191 (0.0419)	-0.0260 (0.0386)	0.0202 (0.0348)	0.0503 (0.0579)	0.00114 (0.0402)
Whether business is run out of the household	-0.0252** (0.0121)	-0.0625*** (0.0208)	-0.000196 (0.0129)	-0.0309** (0.0152)	-0.0894*** (0.0252)	0.0135 (0.0151)
Whether electricity is used to power business	0.0644*** (0.0133)	0.0819*** (0.0188)	0.0467** (0.0200)	0.116*** (0.0193)	0.122*** (0.0247)	0.121*** (0.0272)
Whether business saves in a formal bank account	0.0475*** (0.0164)	0.0323 (0.0230)	0.0614*** (0.0233)	0.0695*** (0.0222)	0.0344 (0.0309)	0.114*** (0.0283)
Observations	1,792	1,790	1,792	1,792	1,794	1,792

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes:1- Regional and industry fixed effects were included in all regressions but are not reported here.

2- 404 firms were classified as in-between according to the manufacturing cut

3- 727 firms were classified as in-between according to the trade cut

Source: Authors' estimation using the MSME survey data 2010 (Financial Sector Deepening Trust, 2012)

Table 3a: Employment shares and annualized growth rate by sector in 2002-2012

	Share of employment (%)		Annual growth rate (%)
	2002	2012	
Agriculture	81.1	65.8	0.4
Mining	0.5	2.6	20.9
Manufacturing	1.9	3.2	8.0
Utilities	0.3	1.3	18.7
Construction	1.1	2.4	10.8
Trade services	7.7	11.3	6.5
Transport services	0.9	1.7	9.2
Business services	0.3	0.8	13.6
Government services	2.9	3.5	4.4
Personal services	3.3	7.4	11.2
Total private economy	97.1	96.5	2.4
Total non-agriculture	18.9	34.2	8.8
Total private non-agriculture	16.0	30.7	9.4
Total economy	100	100	2.5

Source: Authors calculation based on data from Census 2002 and Census 2012.

Online Appendices

Appendix 1. Growth Decomposition Methodology

We modify the productivity growth decomposition method first developed by McMillan and Rodrik (2013) to analyze the patterns of structural change in Tanzania as follows:

Let Y_t be the level of GDP at year t for Tanzania, L_t the number of total employment, Y_{it} the sector level GDP (i.e., sector's value-added) for each sector i , and L_{it} each sector's employment. Economywide labor productivity can be defined as the ratio of GDP to total employment, which can be further displayed as the sum of sector level labor productivity weighted by the sector's share of total employment, i.e., $y = Y/L = \sum_i \frac{Y_{it} L_{it}}{L_i L} = \sum_i y_i S_i$, where y_i is sector level labor productivity and S_i is the share of employment in sector i . We then define $PI_i = \frac{y_i}{y}$ as the relative labor productivity for sector i , i.e., the ratio of sector labor productivity to economywide labor productivity.

The change in economywide labor productivity y between t and $t-k$ can thus be defined as

$$y^t - y^{t-k} = \sum_i (y_i^t - y_i^{t-k}) S_i^{t-k} + \sum_i y_i^t (S_i^t - S_i^{t-k}) \quad (1)$$

Equation (1) is identical to the one in McMillan and Rodrik (2013). For the purpose of this discussion, we further decompose the growth rate of economywide labor productivity.

Let g_y^t be the growth rate of economywide labor productivity between time t and $t-k$, i.e., $g_y^t = (y^t - y^{t-k})/y^{t-k}$; $g_{y_i}^t$ the growth rate for each sector i 's labor productivity in the same period, $g_{y_i}^t = (y_i^t - y_i^{t-k})/y_i^{t-k}$; and $g_{S_i}^t$ the growth rate of each sector's labor share in the same period, $g_{S_i}^t = (S_i^t - S_i^{t-k})/S_i^{t-k}$.

The growth rate of economywide labor productivity thus can be decomposed into the labor productivity growth within each sector and the change in productivity from labor moving between sectors as follows:

$$g_y^t = \sum_i g_{y_i}^t S_i^{t-k} PI_i^{t-k} + \sum_i g_{S_i}^t S_i^{t-k} PI_i^{t-k} (1 + g_{y_i}^t) \quad (2)$$

The first component of the right hand side of Eq. (2) is the sum of each sector's within-sector labor productivity growth rate, weighted by the sector's labor share in the economy and its relative productivity, both at the previous period $t-k$. Meanwhile the second component is the contribution

of structural change. This is the sum of the rate of change in each sector's labor share weighted by the sector's labor share in the economy and its relative productivity in the previous period, $t-k$, augmented by sector's labor productivity growth rate since that period.

Given that S_i^{t-k} , PI_i^{t-k} , and $1 + g_{y_i}^t$ are always positive, the contribution of within-sector productivity growth for a particular sector i to economywide labor productivity growth is determined by the sign of its within-sector labor productivity growth rate $g_{y_i}^t$, i.e., if sector i sees a positive (negative) labor productivity growth rate, $g_{y_i}^t$, this sector's within component positively (negatively) contributes to the economywide labor productivity growth. Similarly, the structural change contribution from a particular sector to overall labor productivity growth is determined by the sign of the rate of change for its labor share in the economy, $g_{S_i}^t$. If a sector's share of total employment falls (rises), and the sign for $g_{S_i}^t$ is negative (positive), this sector negatively (positively) contributes to economywide labor productivity growth through structural change.

The magnitude of structural change's contribution from a particular sector, however, is affected by the initial year's sectoral share of employment, i.e., S_i^{t-k} and the initial year's relative productivity of this sector, i.e., $PI_i^{t-k} = \frac{y_i^{t-k}}{y^{t-k}}$, augmented by the sector's labor productivity growth, $1 + g_{y_i}^t$.

Appendix 2. Employment Information for the Formal Economy

There are three surveys in Tanzania with data relevant to the formal economy: the first is the Formal Earnings and Employment Survey (FEES), for which data is available for 2002, 2010 and 2013; the second is the Central Register of Establishments (CRE), of which data is only available for 2009 and 2010; and the third is the Annual Survey of Industrial Production (ASIP), which only covers formal firms with more than 10 employees in manufacturing and mining. Constrained by the years the censuses were conducted (2002 and 2012), we use the FEES 2002 and 2013 data to analyze the formal economy as part of the whole economy. To ensure consistency between the population census and FEES datasets across sectors, if the employment number in FEES for a particular sector was higher than that noted in the Census, we relied on the FEES data for our analysis. This was done in order to minimize inflated employment figures for certain sectors, since technically FEES covers only the

formal part of the economy and is a subset of the Census's employment data that cover the economy as a whole. Fortunately, there are very few such cases.

In those rare cases, we made adjustments to the FEES total employment numbers using a carefully devised approach unique to each sector. Specifically, the employment values of business services and government services are adjusted from the original Census 2002 numbers to match the FEES 2002 numbers. In order to keep the total employment number the same as in Census 2002, the number of total personal services is reduced accordingly. Further, formal employment in the utilities sector in 2002 and 2012 and personal services in 2012 is adjusted so that the utilities sector contains only formal employment only and personal services contains no formal employment. Accordingly, formal employment in construction in 2002 and trade services in 2012 is reduced so that the total formal employment number matches the FEES reports for these two years. It should be noted that overall these adjustments resulted in small changes, and at no point did we adjust the total employment numbers reported in the Census or FEES.

After completing such adjustments, we were able to analyze formal employment and number of formal firms by different firm size groups based on the micro-data of FEES and ASIP. Again, we ensured comparability of these two data sources when we used them for the analysis. ASIP covers formal firms in the industrial sectors with 10 or more total employees whereas FEES covers a sample of registered establishments with between 5 and 49 regular employees in Mainland Tanzania. Given that the sampling method differs between ASIP and FEES for the smaller sized formal firms (i.e., firms with less than 50 employees), the comparison between the two datasets focuses on industrial firms with at least 50 employees, as such firms should be fully sampled in both surveys. However, in reality neither survey could get a 100% response rate among the firms they were supposed to cover. For this reason, the missing firms in ASIP were added back to the original dataset using data provided by similar firms that responded to the survey, in order to get the number of firms in the ASIP data to equal the numbers of firms the survey was supposed to cover.

This method differs from the one we used with FEES in which sample weights are assigned to a surveyed firm such that it can represent all similar firms. In this case, for firms with employees 50 and more, the weights should have been designed according to the response rate, which is provided for some years in FEES reports. However, from the micro-dataset we obtained for FEES 2002 and 2013, and compared with the response rate reported in FEES 2013, the weights assigned to manufacturing firms with 50 or more employees seemed to be too high. For example, according to FEES 2013 report,

the response rate of private firms with 50 or more employees is 88.4% and is 100% for public firms of the same size in 2013. This implies that the average weight for a firm with 50 or more employees should not be higher than 1.13 (i.e., $1/0.884$). In reality, the weights for such manufacturing firms range from 1.422 to 2.522 in the 2013 FEES dataset, with a mean of 1.775. Moreover, there is no significant difference in the weight ranges in the data between medium size firms with 50-99 employees and large or very large-scale firms with 100-499 and 500+ employees, respectively. Using these high weights without making any adjustments may have inflated the growth in large-scale firms and exaggerated the results. Therefore, we overcome this issue by adjusting the numbers of firms and employment for the manufacturing firms with 100-499 and 500_ regular employees. Specifically, we assign manufacturing firms with 100-499 employees the minimum weight of 1.422 observed in the data for such firms. Furthermore, we did not assign any weight for manufacturing firms with 500 or more employees, based on the assumption that larger firms' response rates are higher than those of smaller firms. Given that 44 such firms that responded in FEES 2013 and there are only 12 similar scale firms in FEES 2002, we assume that the largest firms were fully covered in the FEES and therefore would not need to be weighted.

Overall, the robustness assessment between the four main data sources mentioned above highlights that the employment numbers, as well as total number of firms by industry and firm size, are comparable across the datasets. This provided us with the confidence to utilize these datasets simultaneously for our analysis, in an effort to investigate the primary role of the private non-agriculture sectors in recent economic growth and job creation in Tanzania.

Appendix 3 – Calculation of Labor Productivity for MSMEs

According to the “National Baseline Survey Report for Micro, Small, and Medium Enterprises in Tanzania”, it was estimated that small businesses in the MSME sector contributed about 27% to Tanzania's GDP in 2010 (Ministry of Trade and Industry, 2012, p15). We arrive at a similar estimate for the MSME sector's total value added, although we do so using a different methodology that takes into account the seasonality of business volumes for small firms.

As seasonal fluctuations affect firm level value added for small businesses, particularly since many businesses are located in the rural areas, we calculated the monthly sales value at the firm level before calculating total annual value-added. The MSME survey takes seasonality into consideration by asking respondents to report values of sales for a good, an average and a bad month in a

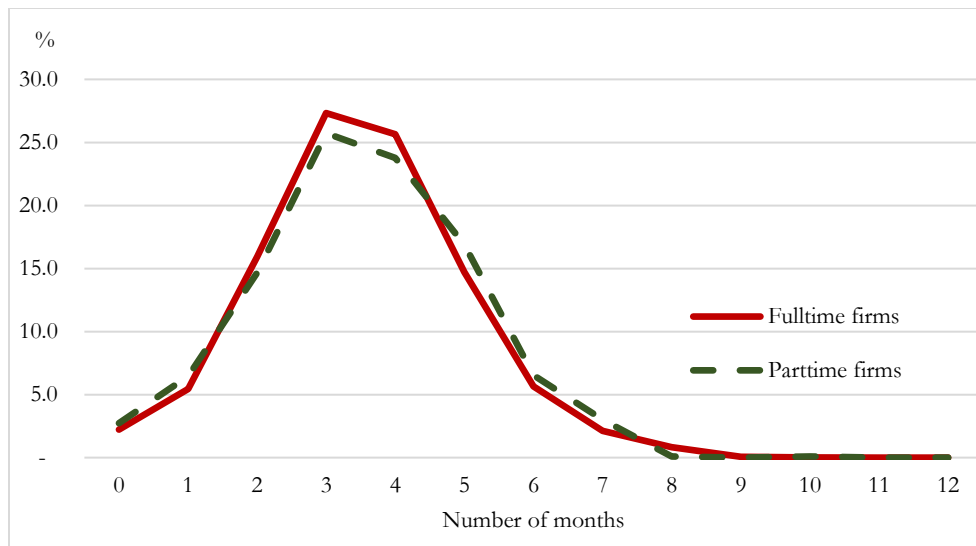
year. It also asked the respondents whether each of the 12 months of the past year was a good, average or bad month. Among the total sample of full-time firms, 4,497 sampled full-time firms reported sales values in a good, bad and average month, while 3,943 firms also rated each month as good, bad or average in terms of sales. Using this we directly calculate the seasonality adjusted annual sales at the firm level for these 3,943 firms.

For the remaining 554 sampled full-time firms that identified fewer than 12 months as good, average or bad classification, we assume all missing months to be bad sales months. There are also some sampled full-time firms that did not provide the relevant sales information, and for such firms we use the average sales of the firms' industries to replace the missing sales information.

In addition, there are 1,131 sampled part-time firms in our sample as well. For such firms, if they reported sales numbers and months according to whether a particular month was good, bad or average, we made similar total sales and value added calculations as for the full-time firms. If a part-time firm did not identify certain months according to the three sales status we treat these missing months as 'no sales' months (i.e., considering them as being seasonally out of businesses). With these adjustments, we are confident that while the calculated value of MSME sales could have been underestimated, it is unlikely to have been overestimated.

Table A3-1 below presents the distribution of average sales months among full-time and part-time firms. In the table, the x-axis represents the number of the months that firms identified as an 'average sales' month, while the y-axis depicts the distribution (in percentage) of total full-time and part-time firms by number of average sales months. The result presented in table A3-1 first shows that no firm (either full-time or part-time) considers having 'average sales' for more than 10 months in a year. In fact, the majority of firms (more than 90% of total) consider themselves to experience fewer than 6 months of average sales in a year, with the distribution being similar between the full-time and part-time firms, indicating that the fluctuation in sales is a common phenomenon for all MSME firms.

Table A3-1: Distribution of sampled MSME firms according to number of months that are average in sales



Note: For the part-time firms' no-sales months, we treat them as bad months in the calculation here for simplification.
 Source: Authors calculation using MSME data

Unfortunately, the MSME survey information on business expenditures was obtained only for the most recent month in the interview. We assumed that such expenditure information represents monthly average at firm level when calculating total value added for the whole year. Based on this assumption, we multiplied this variable by 12 to get full-time firms' annual expenditure and by the actual number of months the part-time firms were operating to get their annual expenditure. We only considered expenditure of intermediate inputs in the calculation, given that very few firms reported other types of business expenditures such as water, landlines and electricity. Furthermore, for the firms with missing expenditure information, we calculated expenditure averages for each sector and assigned intermediate costs based on which sector the firm belonged to. Finally, we calculated the differences between annual sales and expenditures of intermediate inputs to derive the value-added at the firm level.