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Deepening without Broadening?

Jobs in Ghana's Private Sector

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Abstract

Creating productive jobs is one of the greatest challenges in Ghana. This paper looks at job creation and its relationship with firm productivity and the quality of jobs among registered firms in the Ghanaian private sector, based on the 2013 World Bank Enterprise Survey. The study looks at the typology of firms in the industry and service sectors, identifying those that have created the most jobs, and the relative quality of these jobs in terms of productivity and firms' average wage bill. Although the formal private sector employs only a tiny share of total employment, the results show that larger and older firms account for the majority of workers, and formal jobs density is highest in Accra (Accra Metropolitan Area and Tema). Large firms also pay higher wages on average, are more productive, and account for most of the aggregate net formal job creation between 2010 and 2012. However, the relationship between size and productivity is positive and statistically significant, mostly driven by the upper part of the firm size distribution, pointing to potential market segmentations as micro, small, and medium firms create fewer jobs and are less productive. Removing barriers to the growth of micro, small, and medium size enterprises, and to the allocation of resources toward more efficient firms should be a key priority for policy makers.

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Deepening without Broadening? Jobs in Ghana's Private Sector

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I. Introduction

Concerns about job creation and labor market outcomes are central to the public debate and policy agenda in Ghana, and creating more and *productive* jobs is a pressing challenge (World Bank 2016). Many countries in Africa suffer high rates of under-employment or low-productivity employment. In addition, African formal firms, at any age level, tend to be systematically smaller than firms in other regions of the world (Iacovone et al, 2014). Business environment measures such as access to finance, infrastructure, legal rights, availability of skilled labor, access to land as well as certain types of firm characteristics (foreign ownership and/or export status) explain only 40 percent of the difference of the size gap between African firms and firms elsewhere (Iacovone et al, 2014). So what prevents firms from growing? Which are the characteristics of job-creating firms in Ghana?

Ghana's economic growth has outpaced that of most of its African, lower-middle-income peers during the past two decades. Following substantial economic reform in the early 1990s, Ghana has maintained a steady trajectory of economic growth for nearly two decades. Real GDP growth rates averaged more than 4.3 percent per annum between 1991 and 2000, increased to around 5 percent between 2000 and 2005, and accelerated further to 8 percent between 2006 and 2012 — peaking at 14 percent in 2011, when Ghana started producing oil. In 2012, the GDP growth rate slowed down, and it fell to 4 percent in 2014. Economic growth has further been fueled by strong price increases in its main commodity exports, cocoa and gold, for which prices more than tripled between 2000 and 2010 and the start of commercial oil production in 2011, which sparked consumption and investment booms. In 2011, Ghana achieved middle-income status.

This growth has been accompanied by a continued structural transformation from agriculture to services, remarkable poverty reduction, and a parallel migration from rural areas to urban ones. The share of agriculture in GDP has declined steadily, especially in the past decade, but agriculture remains the mainstay for many of the poor. In the twenty year period between 1994 and 2013, the value added of the Ghanaian economy nearly tripled, in real terms (Figure 1). The transport and agriculture sectors were the two largest drivers of this growth in the 1990s; from 2004 to 2013, construction accounted for a substantially larger portion of growth (roughly 15 percent) than in the 10 years prior. Most notably, following the discovery of oil reserves in 2010, the extractives industry has been the largest single source of value added growth, accounting for roughly a third of growth since 2010. The increase in the share of services represents increases in information and communications technology (ICT), transport, finance, and the increasing number of microenterprises operating retail and wholesale activities. By contrast, Ghanaian manufacturing has remained relatively static over the same period; in fact as in several other African countries, the share of the manufacturing sector has declined over time. Between 2005 and 2012, the manufacturing sector contributed only 5 percent to the total increase in value added.

Yet, despite this upward trajectory in economic growth, Ghana's private sector employment remains largely informal. According to the World Bank Ghana Enterprise Surveys the size of the formal private sector remains small: registered firms account for a tiny share of total employment in Ghana, an estimate near 2 percent (estimates based on the GLSS6, World Bank 2016). To these, add concerns that highly concentrated production in commodity-based industries leave the Ghanaian economy at risk of adverse shocks and requiring further diversification.

Together these trends beg the question: has this growth been jobless? The link between economic growth and job creation depends on the extent to which growth generates employment, while the poverty-reducing effects of employment generation depend on the type of jobs that respond to growth: notably this depends on the extent to which poor workers benefit from new jobs. Indeed, since 2005 job creation has more than kept up with the growth of the working-age population**.** Annual job creation reached 4.0 percent between 2005 and 2012, while the annual growth in the working-age population was about 2.6 percent, based on the Ghana Living Standard Survey (rounds 5 and 6). However, relative to its economic growth, the Ghanaian economy has created relatively few jobs. During the same period, average economic growth increased 8 percent per year (much more than before 2005), meaning that every 1 percent increase in economic growth was associated with 0.5 percent increase in job growth. The employment-growth elasticity (the percentage change in employment given a 1 percentage point change in growth) dropped to 0.5 from an average of 0.7 in the 15 preceding years.[1] This suggests a marginal slowdown in job creation in response to economic growth that was driven by sectors that generate low employment: mining and commercial oil production.

Most job creation in recent years has taken place in economic sectors with relatively low labor productivity, and in urban self-employment, rather than wage employment (World Bank 2016). In fact the main source of job creation has been the trade services (wholesale and retail) sectors.[2] In total, Ghana's economy created nearly 3 million jobs between 2005 and 2012, of which most were in urban areas and with nearly half in the trade sector. The agriculture sector, while shrinking in relative terms, continued to create a significant number of jobs in absolute terms. By contrast, with the exception of construction, the industry sector has created very few jobs. Put differently, the bulk of job expansion has occurred in precisely the two economic sectors with the lowest levels of labor productivity — as measured by value added per worker (World Bank 2016).

The dynamics of firms in Ghana's private sector — which types are the main employers and which are the characteristics of the fastest growing firms — add evidence to the heterogeneous aspects underlying recent job growth and to whether job growth is narrowly concentrated or more widespread. If firms employ workers and add jobs commiserate with their sales (in terms of volume and growth), then this recent growth

[1] Based on authors' calculations, using data from the World Development Indicators.
[2] Notably employment also increased in other services activities such as financial and business services and public administration.

can be said to lead to more private sector jobs; if however, firms with more sales employ fewer workers and are not adding jobs at pace, it can be a sign of underemployment and job-less growth.

This paper takes advantage of firm-level data (the World Bank Enterprise Surveys) collected in 2013 on registered — i.e., formal — firms operating in the Ghanaian industrial and service sectors, to examine the characteristics of job-creating firms and analyze the relative quality of these jobs in terms of productivity and firms' average wage bills. The analysis looks at the relationship between job creation (using recall data) and labor productivity by focusing on firms' main characteristics such as age, size, sector, location, exporting status, foreign participation in ownership, managerial capacity, and workforce education. The aim is to provide evidence on whether factor and product markets are working efficiently by allocating jobs towards more productive firms, and whether workers are benefiting from productivity gains in their sectors in terms of higher wages.

Results from the analysis show that larger and older firms account for the majority of workers and that formal job density is highest in the Accra region, including the Accra Metropolitan Area (AMA) and Tema. In addition, large firms pay higher wages on average, are more productive, and account for most of the aggregate net formal job creation between 2010 and 2012. In developed countries, there is evidence that businesses start small and if they survive they grow as they age (Hsieh and Klenow, 2014). In emerging economies, though, this research has found that plants grow at a much lower rate compared to the United States (especially at younger ages); yet older, formal manufacturing plants are larger than their younger counterparts. Growing evidence has suggested that compared to developed countries, firms in developing countries tend to grow much slower over time due to poor marketing functioning that constrains firms to invest and expand. A large portion of this differential, however, is largely explained due to the firm size at the beginning of their operations (Ayyagari et al 2015). Understanding the firm life cycle is crucial to design policies that will boost productivity and employment while reducing inequality.

In Ghana, firms grow over time conditional on firms' survival between firms' birth and present,[3] however growth is concentrated in a subset of firms. While the average firm has more or less doubled its size over its lifecycle, the median firm is roughly the same size as it was at birth (a start-up size of around 7 employees), an indication that only some firms are growing and doing so substantially. Firms that start as micro (with less than 4 employees) are those that see the largest relative scaling later in their lifecycle, a factor of 7.5, to a size that is still smaller than 20 full-time employees. By contrast, firms that start large, say with over 160 employees at inception, appear to roughly double their size early on, then stabilize,

[3] There is an incumbency bias where firms that are unproductive (and often smaller) have exited the market. Since the ES only measures those firms that have survived, the lifecycle likely overestimates the firms' true employment growth.

meaning that in a few short years they have added nearly 180 jobs, more than tenfold the raw increase by firms that are born as micro.

We find that the relationship between size and productivity is positive and significant in our Ghana ES sample, and it is mostly driven by the upper part of the firm size distribution. While statistically significant, though, the magnitude of the correlation is small, implying a limited economic significance: that is, a 10 percent increase in labor productivity is only associated with a 0.4 percent higher firm size. When large firms are removed from the sample, the correlation between firm size and productivity is even weaker, albeit still significant. Quantile regression analysis confirms this finding and the wide dispersion of productivity across firm size. Overall, the analysis of the correlation between productivity and firm size in Ghana suggests an efficient allocation of labor among large firms but not across micro, small and medium firms: more productive firms employ more people and pay higher wages. However, the analysis points to potential market segmentations. Large firms demonstrate this relationship more clearly than do smaller firm categories. Larger firms are also those that started large at inception; though smaller firms do tend to grow at a faster rate, it is very unlikely that those small firms scale to a much larger size over their lifetime.

Findings suggest that there are potential productivity gains among MSMEs and that a vibrant firm life cycle is often missing among them. Tackling the challenges faced by MSMEs is critical to identify the potential policy initiatives to foster additional job creation through higher productivity, as well as promoting shared prosperity by focusing on disadvantaged sectors and regions. Desirable outcomes in policies would be to encourage growth opportunities through access to markets and improved links between small and young firms with large, mature and exporting firms. This in turn would encourage both technology transfers as well as opportunities to access larger markets for starters and small firms.

The paper is organized as follows: Section II gives a brief literature review; Section III discusses the data source and illustrates where the jobs in the formal private sector are by age of the firm, size, location and sector; section IV presents the results of determinants of firm size, job creation and average wage as well as discusses the correlation between firm size and productivity; and section V concludes.

II. Literature Review

A keen interest has been given to the topic of what types of firms are the predominant employers in the private sector, and which types, in turn, are the main contributors to employment growth. Research attempting to answer the latter question has been fairly consistent: in general at lower income levels, small and medium-sized enterprises (SMEs) are the main employers (Ayyagari et al 2014; Aga et al 2015), while larger firms tend to account for the major share at higher income levels (Haltiwanger et al 2013).

Particularly among developing economies, once micro firms (including sole proprietorships) are included, the predominance of the smallest firms as the source of formal, private sector employment increases (World Bank 2014). However, in terms of employment growth — that is the expansion of the overall stock of employment — the evidence has been mixed. Particularly, while some have found (Ayyagari et al 2014, for example) that young and small firms are the driving force of growth, others have argued that it is the specific dynamism of young, start-up firms that accounts for this growth (Haltiwanger et al 2013).

Parallel to this has been a focus on the lifecycle of firms. Potential entrepreneurs must assess their competition and understand their relative productivity after competing in the market (Lucas 1978; Melitz 2003); if they find themselves to be profitable in these markets, they will continue operations — including the requisite investments needed — if not, they will exit those same markets (*Ibid*; Olley Pakes 1996). This is the modeled mechanism in markets that are competitive and allocatively efficient, under which both revenue and employment shares will flow to more productive firms (Olley and Pakes 1996; Melitz and Polanec 2012). Where those conditions are less ideal, investment among incumbents can be discouraged, average firm size will be dampened downward, and new entrants are less dynamic and productive. The age-size correlation has been widely reported: Hsieh and Klenow (2014) do show stunted lifecycle growth for plants in Mexico and India. Simultaneously, firms may face costs at entry that demand higher initial investment, inducing a higher starting size, which can have lasting effects for firms that are "born large". Based on a sample of 120 developing countries, Ayyagari et al (2015) find a consistent trend over the lifecycle of firms; however, start size explains the vast majority of variation in current size. Indeed, a specific advantage of using micro-data is to see if these effects are heterogeneous within economies.

A positive correlation between firm size and productivity has been found in developing countries, suggesting the existence of "static" allocative efficiency. Based on the World Bank Enterprise Surveys for developing countries, Ayyagari, Demirgüç-Kunt, and Maksimovic (2015) documented that large firms are typically more productive than small and medium firms.[4] Li and Rama (2013) also find that productivity dispersion and growth prospects vary a lot in developing countries compared to advanced economies, but not as clearly correlated with firm size. Restricting the sample to manufacturing firms from nine Sub-Saharan African countries, Van Biesebroeck (2005) finds that large firms achieve higher productivity levels and are more likely to survive. In contrast, the commonly found higher growth rates for small firms are not replicated in his African sample, and the distribution of firms changes very little over time. Firms are more likely to have started out large than to have grown. We find that larger firms are more productive, but that the positive relationship between size and productivity is driven by large firms, consistently with the studies above.

[4] It has to be noted that WB ES may not include micro firms (1-4 employees); in some countries, including Ghana, registered micro firms have also been sampled.

The evidence from Ghana itself paints a picture of dampened private sector job growth, despite nearly twenty years of sustained economic expansion. Evidence from the early 1990s showed signs that job growth was possibly driven from the middle, by medium-sized firms, with signs of low-value-added firms converging with higher-value-added counterparts (Teal 1999). However, more recent evidence has shown a mismatch between GDP and employment growth — with jobs not keeping up with economic expansion — in part due to a lower labor intensity among fast growing sectors and labor absorption by slow-growing ones such as manufacturing and agriculture (Aryeetey and Baah-Boateng 2015). That is, the sectors that are growing are not relying on expanding their employment to grow. One study notes that while real GDP growth averaged nearly 6 percent between 2000 and 2010, employment growth averaged only 3 percent, an indication of so-called "jobless growth" (Alagidede et al 2013).

Davies and Kerr (2015) link these patterns to firm dynamics. They find that between 2003 and 2013, there was a broad, net contraction of labor in all subsectors and across size categories. Over this last period, the overall exit rate of manufacturing firms[5] was about 21 percent (another 22 percent could not be traced). In their study, small and young firms are more likely to exit the market, echoing earlier findings from Frazer (2005), and higher exit rates were found in the food and textile and garments industries. In fact, though productivity has been found to mitigate the risk of exit — an indication that competitive markets may induce more productive firms to replace less competitive incumbents — small firms remain particularly at risk of exiting the market, even at similar productivity levels (Soderbom et al 2006). Relatedely, there was little *within-firm* growth among a panel of manufacturing firms in Ghana between 1987 and 2003 (Sandefur 2010).[6] Yet while these studies draw from extensive evidence, Ghana's recent boon — with the 2010 discovery of oil reserves — may welcome in substantial job growth.

III. Data and Descriptive Statistics

The firm-level data used in this paper are taken from the World Bank's Enterprise Surveys (ES) project. These data were collected in Ghana in 2013–14 and refer to fiscal year periods between 2010 and 2012, though they are cross-sectional and utilize recall information as well as financial and employment records.[7] As cross-sectional data, however, the ES do not capture firm entry and, particularly, firm exit and thus there is the potential for an incumbency bias by only gathering information from surviving firms.

[5] They sampled about 1,000 manufacturing firms from the Ghana National Industrial Census (2003) and surveyed them in 2013; new entrants in 2013 are not captured—only those firms operating in 2003. Results reported here refer to the exit measured as those firms that closed and that could not be found/tracked in 2013.

[6] Using a panel data on manufacturing firms between 1987 and 2003 in Ghana, Sandefur (2010) showed that there was actually little evidence for within-firm growth: firms that were small in 1988 remained small in 2003, and the big firms operating in 2003 were already big in 1988.

[7] The data necessarily rely on recall questions for sales revenues and employment, introducing an element of recall bias. When possible records are taken from books and employment records directly. Of 1,940 firms interviewed, 29 percent were taken fully or partially from books, while 63 percent were based on estimates computed with some precision. Eight percent were regarded as arbitrary and unreliable; all assessments are based on enumerator notes and opinion.

Nonetheless, the ES include rich information about the business environment, firms' characteristics and owner's characteristics. The data were gathered from interviews with top managers and CEOs in the formally registered non-agricultural private sector; firms that are fully state-owned are excluded from eligibility for the study.[8] As such they notably omit informal businesses, a sector known to comprise a predominant share of employment in Ghana. Another notable point in the case of Ghana is that the global Enterprise Survey methodology excludes extractive industries. Firms eligible for interviews operate in the manufacturing, construction, retail, wholesale, hospitality, and transport sectors (as well as IT firms).[9] Additionally, in the case of Ghana, firms with between one and four full-time workers (so-called 'micro' firms) were interviewed, and the data used here include this supplementary source of data.

The study was conducted using a stratified survey design, along dimensions of firm size (micro [1–4 employees], small [5–19], medium [20–99], and large [100+]), sector of activity within industry and services (food, chemicals/plastics/rubber, metals, other manufacturing, construction; retail, other services[10]), and in four of the most active economic cities in Ghana: Accra Metropolitan Area and Tema (Accra), Kumasi (Ashanti), Tamale (Northern) and Takoradi (Western). In all, interviews were completed with 1,324 firms. Table 1 provides basic descriptive statistics of the sample.

The sample consisted of 720 small, medium and large registered establishments and 604 registered microenterprises with the Ghana Registrar's General Department. These establishments were located from lists compiled from the following: firm registry, list of firms paying value added tax (VAT), list of large taxpayers, Ghana Chamber of Commerce and Industry, business associations; General Department of Cooperatives, District Assembly registries, and block enumeration conducted by the fieldwork team.

The information collected refers to characteristics of the firm at the moment of the survey or to the last completed fiscal year (2012). Sales, employment, and labor productivity annual growth rates are calculated comparing data from the last complete fiscal year of each survey and recall data. Consequently, growth rates refer to the period 2010–2012. In general, the private sector firms considered were small (with an average size of just under 13 employees).[11] Firms have been operating for just under nine years on average and while the average firm has more or less doubled its size over its lifecycle, the median firm

[8] Firms that are partially state owned could be included, however in our sample we have only 8 firms with at least 1% of state ownership, making any analysis by state ownership not meaningful.
[9] For more information on methodology, see: www.enterprisesurveys.org/methodology.
[10] The Ghana ES include two sectors within industry according to the group classification of ISIC Revision 3.1: all manufacturing sector (group D); and the construction sector (group F). The ES does not represent firms operating in the mining and quarrying and electricity sectors (groups C and E). Within the service sector, the ES includes: wholesale and retail trade, hotels and restaurant (groups G and H); transport, storage, and communications sector (group I); and computer and related activities (group K, subsector 72, IT). It does not represent financial intermediation (group J), real estate and renting activities (group K, except sub-sector 72, IT, which was added to the population under study), and all public or utilities-sectors.
[11] Table 2 presents some figures in their logged form; the exponentiated values are given here for simplicity and presentation.

is roughly the same size as it was at birth (a start-up size of around 7 employees), an indication that only some firms are growing and doing so substantially.

A number of caveats about the data should be kept in mind. First, the sample of the ES survey, while designed to be nationally representative of the universe of formal private sector firms working in manufacturing and services, is subject to the quality of sampling frames, and information on aggregate figures are subject to issues of nonresponse. The ES relied on several sources to build a sampling frame: the firm registry, the list of firms paying VAT, and the list of large taxpayers maintained by GSS were complemented with additional lists of firms from the Ghana Chamber of Commerce and Industry and Business Associations. Nonetheless, the sampling frame proved to be incomplete and was not sufficient to draw the target sample. A block enumeration was also undertaken in order to build an additional list. The block enumeration allowed a list of establishments to be physically created, from which the sample was drawn.

Based on the ES, the employment stock in 2012 is about 170,000, including permanent and temporary employees, equivalent to about 15 percent of the employment stock estimated in 2012 from Ghana Living Standard Survey round 6 for private workers in the same sectors (about 1.24 million). Considering that not all the private wage workers in those sectors are working in formal firms, and that only about 30 percent of private wage workers report having either a written contract or any type of social insurance benefits (to proxy formal workers), the employment stock captured in the ES formal firms represents about half of the "formal" employment stock estimated through the GLSS6 in the same sectors (World bank 2016). The representativeness of the ES will be further validated once the Establishment census data recently collected by the Ghana Statistical Service will be available.

Two broad metrics of private sector employment are informative.[12] The first is the static stock of employment, which is an indicator of distribution of jobs in the formal private sector. That is, what is the share of private sector employment accounted for by certain types of firms? A second broad metric is the rate of job growth (overall). That is, what is the rate at which the stock of jobs is growing, and which types of firms are responsible for that job growth? The latter metric can be decomposed as well into firms that increased their employment levels between 2010 and 2012 (job growth) and firms that shed jobs (job contractors).[13]

[12] For a full discussion of results and metrics using similar data, see Aga et al. (2015).

[13] A well-documented issue with periodic growth data on firm growth and employment is a so-called "reversion-to-mean" effect, where growth measures of firms are upwardly biased when the base of the growth rate is the first period considered, as in a common arithmetic growth rate. The source of this bias is that firms that have shed jobs are then the likeliest to quickly add those jobs in times of recovery; conversely, using the end-point of measurement (in this case 2012), has an equivalently downward bias. To ameliorate this problem, the two-period average of full-time employment is used to classify firms, $E_{i,avg} = 0.5\ (E_{i,2012} + E_{i,2010})$, where E is the full-time employment of firm i in fiscal year 2010 and 2012 respectively (As all figures are based on survey estimates, employment figures are considered as survey-weighted).

Formally, the share *s* of the stock of employment (E) for a given category of interest, *c*, and firm i, is given by:

$$(1) \qquad s_c = \frac{\sum_i^c E_{i,avg}}{\sum_i^{Ghana} E_{i,avg}}$$

Where the numerator is the sum of employment in firms belonging to a given cut and the denominator is the sum of all employment in the private sector in Ghana, over the two-period average. Firm *i*'s share then is simply noted as $s_i = \frac{E_{i,avg}}{\sum_i^{Ghana} E_{i,avg}}$.

To measure employment growth over the two periods, a widely used measure (see Davis et al (1996); Konings et al 1996; Pivetz et al 2001; Haltiwanger et al 2013; World Bank 2015; Aga et al 2015 for notable examples) of firm growth is used. This is given by:

$$(2) \qquad g_i = \frac{(E_{i,2012} - E_{i,2010})}{E_{i,avg}}$$

It is important to note that this measure is indicative of the dynamism of individual firms; as such it reflects growth on a broader scale. That is, while it is a reflection of growth of a single firm, it does not indicate the collective impact of sectors of the economy. The latter point may be of particular interest as it more directly measures, for example, the relative growth of SME vs. large firms or young vs old. Specifically, the aggregate net rate of employment growth (or net job creation) in category *c* is then[14]:

$$(3) \qquad g_c = \sum_{i \in C} \left(\frac{E_{i,avg}}{\sum_i^c E_{i,avg}} * g_i \right)$$

Noting that in the case that the category of interest is the entire country of Ghana, equation (3) is simply $\sum_i^{Ghana}(s_i * g_i)$. It is also often useful to discuss job growth both in terms of both ***gross job creation*** and ***gross contraction*** rates. For these rates, equation (3) is limited to firms with positive (negative) growth rates and $|g_i|$ is used. The net job creation is measured by the difference in full-time, permanent employment over a two-year period, using recall data. Net job creation captures the number of jobs created minus the number of jobs eliminated.

[14] Based on a similar formulation as explained in Haltiwanger et al (2013).

The Share of Employment Stock: Where Are Workers Employed in the Formal Private Sector?

Where do people work in Ghana's formal private sector? Figures 2–3 show the share of the stock of employment and establishments by firm size and age, while Table 1 presents the share of firms and employment by sector and location.[15] Immediately, these figures shed light on the size distribution of firms in Ghana's private sector. The vast majority of firms (over 90 percent) have fewer than 20 employees. The ES estimates that registered firms in Ghana are composed of microenterprises with 0 to 4 workers (63 percent); small firms with 5 to 19 workers (28 percent); medium firms with 20 to 99 workers (7 percent); and large firms employing more than 100 workers (2 percent) (Figure 2).[16] However, the minority of large firms in Ghana account for nearly half the entire workforce in the formal private sector. The employment stock distribution is concentrated in larger firms (47 percent), and roughly equally shared between microenterprises (14 percent) and small (17 percent) and medium firms (21 percent). Put another way, large firms in Ghana tend to be particularly big: in fact the average large firm employees nearly 300 full-time workers. This pattern runs counter to cross-country analysis that finds that in economies with lower income levels the majority share of employment tends to be found in SME firms (Ayyagari et al. 2014; Aga et al 2015). Rather this pattern more closely adheres to the skewness found in higher-income economies, where large establishments are few but predominate.

In terms of age, a plurality of firms are mature[17] — having been in operation for at least 10 years — however, a third of firms are also young start-ups, being under 5 years old. On average, most firms (43 percent) are "mature," having been in business for more than 11 years, while 25 percent of firms have been operating between 6 and 10 years on average ("mid-age"). Young firms operating between 3 and 5 years represent 19 percent of firms, while start-ups (2 years) and new entrants (in operation for one year or less) represent 6 percent and 7 percent, respectively (Figure 3). The share of entrants and start-ups is higher in the service sector than in industry (14 percent and 9 percent, respectively), indicating lower entry costs in the service sector. This may be an indication that firm entry may be relatively robust, which

[15] ES data are collected on an establishment-level basis. Only an estimated 1.6% of establishments in Ghana are estimated to be part of a larger firm, and so establishment and firm are used interchangeably.

[16] The size categorization refers to the average number of permanent and temporary employees, based on reported and recall data.

[17] As noted above, firms are classified by their age as of 2010. The reasons for this are twofold. First, as growth measures are considered the age of firms as of their first period is more appropriate; secondly, as the ES data rely on sampling from source lists that are often lagged by a few years, there can be an upward bias in terms of firm age as very young firms are frequently omitted. Using age as of 2010 ameliorates this concern. For firms that were founded after 2010, their age is considered <5. For employment measures, 2010 employment is set to zero.

is borne out by firm entry rates that doubled between 2004 and 2012.[18] Yet while mature firms account for four out of ten firms, they also constitute two-thirds of employment, an indication of grouping of larger firms among older firms. In fact, mature firms are on average four times larger than young, start-up counterparts.

In terms of the distribution by sector, there is some evidence of sectoral concentration. While industry makes up to nearly 50 percent of establishments, it accounts for more than 70 percent of employment, an indication of much higher relative size in the sector (Table 2). This scale of establishments is particularly remarkable in the areas of chemicals, rubber, plastics manufacturing, and construction. For instance, while only accounting for roughly 5 percent of firms, those in chemicals, plastics and rubber manufacturing, likewise as construction, account for a fifth of employment each (that is, four out of ten workers combined). By contrast, firms in retail and wholesale trade account for more than half of all firms put together; yet these establishments are disproportionately small accounting for only a quarter of the employment stock (at ten and five percent, respectively). In other words, the latter groups are themselves bellwethers of concentration of employment in larger-firm sectors; while retailers and wholesalers are disproportionately small. Figure 4 shows that larger firms are operating indeed in the manufacturing sector, export more than 10 percent of their sales to foreign markets and that larger firms in Tema are larger than elsewhere.

More than half of the workers in formal firms are concentrated in the Accra region, in Accra Metropolitan Area (AMA) and Tema. The distribution of jobs reflects the geographical distribution of formal firms: 54 percent of firms are in the AMA, and they employ 60 percent of the formal private sector workforce; 14 percent of firms are in Tema; 22 percent are in Tamale (Northern region); and 10 percent are in Takoradi (Western region). The location of establishments is related to agglomeration effects (urban centers). Thus the employment density is highest in Accra and decreases with the size of the firm locality (Table 1).

Employment Growth: Which Firms Are Adding Jobs?

Figure 5 shows the aggregate net growth employment rate, which was an estimated 8 percent per annum — that is the stock of employment was estimated to grow at nearly ten percent a year over the period 2010 to 2012. Underlying this net rate was a job creation rate of nearly twelve percent and a contraction rate of four percent. Put differently, then, the growing firms over this period added jobs at nearly a fourfold rate compared to the firms that shed jobs over the same timeframe.

[18] Based on the World Bank's Entrepreneurship database, which includes information on the density of new businesses registered per 1,000 people. By this metric, in 2004, the first available data point, this rate was 0.49; by 2012 the rate was 0.90 (and was 1.09 in 2011).

Yet a breakdown of these rates by size gives a more nuanced picture (Table 3). In fact, large firms account for nearly sixty percent of net employment growth. On the other end of the size spectrum, micro firms accounted for almost a quarter of the net growth, a sign of a potential "missing middle" of job growth. On net, larger firms are becoming larger, while those with the fewest employees account for the second-largest share of employment growth.

The middle column of the table shows that job contraction rates themselves are not comparatively large. The largest rate of job contraction is among small firms, which shed jobs at about the same rate that they added them, resulting in a nearly flat growth rate on the whole. Even then, this rate is a mere 2 percent in either direction. Together, this indicates a fairly low amount of *churning* among small (and medium-sized) firms, counter to high job turnover rates noted elsewhere using similar data (Aga et al 2015).

In terms of firm age, while young and mature firms are responsible for nearly equal shares of gross job creation, on net young firms constitute nearly half of job growth, as mature firms are more likely to contract (i.e., be among those that shed jobs). By sector, in line with the relative large-size firm concentration in chemicals, plastics, and rubber manufacturing, firms in that sector are also the largest contributors to net employment growth. But food manufacturers, which are comparatively small, are also responsible for nearly a third of the net job growth.

IV. Firm-Level Regressions Results

These stylized facts lend themselves to further questions on the underlying relationship between firm characteristics, size, and growth. Following the seminal paper from Olley and Pakes (1996), a wide-ranging body of literature has theoretically argued that in an allocatively efficient and fluid market, more productive firms will command and attract greater shares of the market, whether those shares are measured by firm sales or employment (see for example Bartelsman et al 2013). As a result, one expects firm size to be positively correlated with productivity. If market competition is indiscriminately present, this relationship is expected to be present regardless of firm size or market share. Together, these conditions imply the following hypotheses:

Hypothesis 1: Absent distortions, firm size will be positively associated with firm productivity.

Hypothesis 1a: Variance in the relationship between firm size and productivity will be present under cases of market segmentation.

Likewise, the presence of distortions may hamper firms' incentives to invest and grow; just the same, the absence of these larger competitive firms can permit less efficient or productive firms to remain in the market. Each is consistent with stagnant growth over the lifecycle of firms (Hsieh and Klenow 2014). This leads to the hypothesis:

Hypothesis 2: Firm size will be positively related to firm age.

In terms of firm dynamics, recent work has focused intently on the role of both firm size and age, arguing that each — though their varying degree of importance is a matter of debate — is inversely related with growth. That is younger, smaller firms are expected to grow at faster rates (see Ayyagari et al 2013 and Haltiwanger et al 2014 for alternative perspectives on the relative importance of each).

Hypothesis 3a: Smaller firms will exhibit faster employment growth rates.

Hypothesis 3b: Younger firms will exhibit faster employment growth rates.

Lastly, regarding the quality of jobs, one indicative — if incomplete — measure has been the average remuneration per worker (a measure approximating the wage bill per worker). A long-standing and consistent finding has been that larger firms tend to pay higher wages (Oi and Idson 1999). This has been called the "wage-size-effect", and researchers have attributed it to larger firms' comparative ability to draw, compensate, and retain better workers. Similarly, these large firms, due to their scale, have more difficulty in closely monitoring worker performance and so are more inclined to incentivize workers through higher wages.

Hypothesis 4: All else equal, larger firms will pay higher wages.

While this paper will utilize representative firm-level data, which are survey weighted, similar weights scaled by employment (employment-weighted) estimates are also informative. While the former employ survey-weighted estimates, reflective of the relative incidence of establishments — and provide central tendencies based on firm-level characteristics — the latter give weight based on firms' relative role as employers. While expectations for both survey- and employment-weighted estimations are similar, their interpretation differs slightly as they are each representative of somewhat different populations of inference. For instance, while a survey-weighted regression on firm growth gives an indication of the average rate for the typical firm, the employment-weighted result gives an estimation relative to such firms' relative role as employers in the private sector.

The general estimation form is then:

$$(4) \qquad LHS_i = y_0 + \sum_{a=1}^{A} \beta_a a_i + \sum_{s=1}^{S} \beta_s s_i + \sum_{l=1}^{L} \beta_l l_i + \sum_{f=1}^{F} \beta_f f_i + \varepsilon_i$$

Employment-weighted estimates by contrast present relative estimates and thus provide some indication of job re-allocation between types of incumbent firms. This specification is then expressed as:

$$(5) \quad LHS_i s_i = y_0 + \sum_{a=1}^{A} \beta_a a_i s_i + \sum_{r=1}^{R} \beta_s r_i s_i + \sum_{l=1}^{L} \beta_l l_i s_i + \sum_{f=1}^{F} \beta_f f_i s_i + \varepsilon_i$$

Where A consists of a series of age fixed effects; R represents sector-level fixed effects; L is comprised of location dummies; and F consists of firm-level characteristics. LHS indicates the appropriate dependent variable, indicating measures of firm size, growth measures, and job quality (here as proxied by average wage bill); firm-level co-variates in F' will also be adapted when necessary based on the specifications. Results from employment-weighted regressions are found in the Annex.

Results

Table 4 presents survey-weighted regression results with the dependent variable being the (log of) full-time permanent employees at the end of fiscal year 2012. Fixed effects for sector and location are included and align with the categories of stratification for the survey design.[19] Age category fixed effects are included for categories defined as 0–5; 6–10; 11–20; and 21+ years.[20] Due to concerns of endogeneity with firm size and to be in-line with growth measure categories, age category dummies are determined as of the time of the recall variable for growth rates, that is as of fiscal year 2010. As firm size at birth — that is the number of employees as the start of operations — has been shown to largely explain variation in firm size (Ayyagari et al 2015), it is included in all regressions as well. Controls for foreign ownership (of at least 10 percent) and exporting status (also at a level of 10 percent or more) are included, as is the share of workers with a secondary education as a proxy for labor skill level.

The table shows a positive and significant relationship between firm size and labor productivity; this is as expected in an efficient market,[21] in that the result indicates that more productive firms are also those that tend to employ more employees on average. While statistically significant, though, a comparatively lower magnitude of the coefficient belies limited economic significance: that is, a 10 percent increase in labor productivity is only associated with approximately firm size that is only 0.4 percent higher (col. 3). As shown above, Ghana's formal private sector is characterized by a multitude of very small firms as well as a handful of very large ones. To examine if either end of this spectrum is driving results, we run regressions both excluding large and then micro firms (columns 4 and 5, respectively). Column 4, which excludes large firms (those with at least 100 employees), demonstrates an even lower magnitude, an elasticity of under 0.3 percent associated with 10 percent higher labor productivity, indicating that the relationship between size and productivity is in part driven by firms in the upper end of the size distribution (though the relationship remains significant). In fact, when the very smallest micro firms are excluded (column 5), the magnitude of the coefficient notably doubles to an elasticity of 0.075.

[19] For sector, these are manufacturing: basic and fabricated metals/machinery and equipment; chemicals, plastics, and rubber; food; and other. Services include: retail; other services. By location, these categories are: Accra; Tema; the North; and Takoradi.
[20] A similar categorical approach is used by Ayyagari et al 2015.
[21] Revenues per worker (labor productivity) are winsorized at the 2.5% tail ends of the distribution to account for possible outlier values.

To investigate this further, column 6 presents a quantile regression for the median value of firm size — as compared to the mean value estimated by simple OLS in the first five columns. While as a median estimate, the quantile regression can be presented as robust to possible outliers,[22] it also indicates that the relationship between firm productivity and size is not uniformly applicable across the distribution of firm size. That is, depending on firm size, the observed relationship between labor productivity and the number of employees is different. In fact, Figure A.1 plots the coefficients of selected variables from the quantile regression at different quantiles of the size distribution; that is, the figure shows the estimated relationship as firms grow larger at the right end of the graph. The figure belies the insignificant sign of labor productivity: for larger firms, the relationship between labor productivity and firm size remains positive and significant, but the same does not hold for smaller firms. In fact, table A.1a shows that at the 10th percentile of firm size, the relationship between labor productivity and size has an elasticity of just 0.013 (statistically equivalent to zero); there is more than a five-fold difference compared to a magnitude of 0.063 at the 90th percentile.

Generally, results hold for the employment-weighted regressions (table A.1) with the trend that the coefficient between firm size and labor productivity is higher for larger firms still observed. In fact, the employment-weighted results, which give greater consideration to sectors with larger employment shares and thus (reflecting results above) larger firms, also show greater elasticities between labor productivity and size, driven by the concentration of formal private sector employment in larger firms. Interestingly, the effect between age category and firm size, also varies over the size distribution, indicative that the largest firms are those that are those that are able to scale up over time. This is true in both the survey- and employment-weighted regression, with the scale effect even being larger in the latter specifications, a demonstration that these larger firms (which receive greater weighting in the employment-weighted regressions) perhaps operate in a market somewhat apart from their smaller counterparts. This holds even when controlling for initial firm size, which incidentally is highly significant when related to current size. That is, large firms are likely to have started large, and these same firms show notably more acute relationships between productivity (and age) and size.

In table 4, by sector, in the manufacturing sectors of metals, chemicals, rubber, and plastics, individual firms tend to be larger (in the case of the former table) and to have relative concentrations of employment, as a sector (shown in the latter table). By contrast, firms in the garment manufacturing sector tend to be both smaller and constitute less of a source of employment. Together the results confirm the stylized descriptives above.

Table 5 treats the labor productivity level (in logged form) as the dependent variable. Size categories (based here on the two-period average described above) are included to see if there are

[22] Outlier concerns in OLS estimates are also taken into account through the winsorized measure of labor productivity.

categorical differences among the size categories, as opposed to the continuous measure. As results above seem to be driven by large firms, we omit these firms as our reference size category. In line with the results from table 4, micro, small, and small-medium firms all demonstrate statistically lower levels of labor productivity, indicating that these firms employ fewer workers and also generate lower revenues per each worker. Again, this points to possible market segmentation and holds in the employment-weighted results (table A.2). Column 2 excludes large firms, while column 3 excludes the many but very small micro firms. Results from the latter column, indicate interesting trends by sector. For instance, while the garments sector shows lower or statistically insignificant labor productivity levels in the first two columns, firms in this sector actually have statistically *higher* labor productivity when micro firms are removed, indicating that the very smallest firms in that sector are also among the least productive. Similar results emerge in the retail and wholesale sectors, where micro-level traders are also those with the very lowest levels of revenues per worker.

Table 6 includes two different versions of firm-growth measures: columns 1–3 use the ratio of firm (full-time permanent) employment in the last fiscal year to the firm size at start-up. These columns use the same base models as those above. Necessarily then they include the size at start-up as the relevant base; this variable virtually by construction is negatively and significantly related with the size ratio, indicating that firms that start small are those to scale and those that start large are less likely to scale over their lifecycle. Similarly, column 4 treats firm-level growth (as described in equation 2) as the dependent variable, with firm size in fiscal year 2010 as the base. Columns 1–3 show that as firms age, indicated by significantly positive age dummies, they scale over their lifespan. Likewise in column 4, negative (and of progressively greater magnitude) coefficients for more mature age cohorts indicate that it is indeed younger firms that are growing at a faster pace as are smaller firms (as indicated by their starting size in 2010). Still, there is no significant relationship between firm productivity and employment growth (though this would also be subject to concerns of reverse causality).

Figure 6 presents the average size of firms in age cohorts relative to their size at birth, that is, the size ratio. Firms that are five years or younger are scaled to equal one, a convention following Hsieh and Klenow (2014). In line with results, firms that start as micro are those that see the largest relative scaling later in their lifecycle, a factor of 7.5 for firms that are 26 years or older. But this scaling appears to happen relatively late in the lifecycle; it should also be noted that as only survivors are measured, there is an incumbency bias where firms that are unproductive (and often smaller) have exited the market. That is, we only measure those firms that have survived and so this lifecycle likely overestimates the true size ratio of firms, a bias that is likely to be more prevalent if there is a so-called liability of smallness, where smaller firms face a higher risk of exiting the market. Moreover, it should be noted that the sheer scale of these increases is important: micro firms start with fewer than three employees on average, meaning that if they do survive for upward of a quarter of a century, they have only increased to a size that is still smaller than 20 full-time employees. By contrast, firms that start large, say with a minimum of 50 employees, or start

particularly large, with over 160 employees at inception, appear to roughly double their size early on, then stabilize, meaning that in a few short years they have added nearly 180 jobs, more than tenfold the raw increase by firms that are born as micro.

Lastly, table 7 displays the same base models, with the (log) wage bill — that is the total remuneration cost, including wages but also social security payments — per worker. In line with several other instances in the literature on the wage-size-effect, the model controls for the proportion of workers with secondary-level education, which is positively and significantly associated with a higher wage bill per worker, though this coefficient loses significance when micro firms are excluded, pointing to a segmentation of the very smallest firms. Similarly, the correlation between the average wage bill and labor productivity is positive. However, the size story is less consistent. Though large firms do enjoy a "wage premium" relative to other firms, the story is not consistent (that is relative to the omitted micro category) across all increasing size groups.

V. Conclusion

Taken broadly, Ghana has been experiencing sustained economic growth, which has been bolstered by recent oil production. What is more, evidence from macro-level data shows that recent growth has not been jobless, showing expansions of employment at pace with GDP growth. Despite this growth, the formal private sector measured through the WB ES 2013 data is small and in aggregate, the number of jobs in the formal sector is still negligible compared to the size of the labor force measured through the national household survey (GLSS6) in the same year.

Indeed, using micro-level evidence affords the opportunity to disaggregate these effects. One recent account argues that employment growth lagging GDP expansion had been the result of labor being absorbed into slow-growing industries (Aryeetey and Baah-Boateng 2015, World Bank 2016); the evidence presented here supports that finding, indicating that these sectors may be lagging behind in their absorption of labor relative to their capacity. This is notable in light of evidence of the firms operating in the formal private sector: while micro and small firms make up the majority of firms, large firms are the predominant employers. Likewise, these larger firms are responsible for the largest contributions for employment growth, on net.

Firm-level regression results provide further evidence of the prominence of already-large firms. While, encouragingly, there is a positive and significant relationship between firm productivity and size (an indication of market efficiency), there is also evidence that it is driven mostly by larger firms and that the magnitude is low. In addition, no such relationship between employment growth and labor productivity is observed. Yet larger firms remain those with higher labor productivity. This is a possible

indication that the net job creation constituted by those same firms is also met with increase in revenues, keeping labor productivity somewhat flat.

Together, these trends point to a deepening in the private sector —in that large and older firms appear well-heeled —but a lack of broadening in that the smallest firms do not show the same scaling up. These latter SMEs may be growing faster relative to their size, but this is small compared with the sectoral growth represented by larger firms. Firms that make up a large share of their market, moreover, show robust growth, further evidence that there should be caution of sectoral and other concentration and may indicate a need for diversification and amenable conditions for smaller-scale firms to grow and prosper.

The analysis has several policy implications both to improve the overall investment climate and to target specific programs to MSMEs and sectoral productivity gains by improving access to credit, access to electricity (ranked as the top constraints by firms of all sizes) and by encouraging the competitiveness of exports**.** Expanding firms' connectivity to local, regional, and global markets would help increase their competitiveness, product sophistication, and exports. Whereas foreign markets could be a source of demand for Ghana's products and services, natural resources (cocoa, gold, oil) accounted an overwhelming share (87 percent) of exports in 2014; other exports (free on board) accounted for only 12 percent of GDP. Overall, only 8 percent of registered firms were exporting in 2013, and most of them were large firms. This suggests the need for reforms to improve trade logistics and strengthen linkages with neighboring trade partners. Policies aiming at developing value chains are viable policy options, including capacity building; extension; transfer of knowledge; and tools to help micro and small and medium enterprises (MSMEs) involved in the value chain locate new buyers and markets, improve basic business practices, develop logistical supply programs with buyers, and expand contract farming to enhance the links with smallholders. For example, the agro-processing sector, which processes raw materials into market-ready products, offers opportunities to develop value chains, create productive jobs, and retain value locally (instead of exporting raw products) (World Bank 2016).

Beyond policies to improve the overall investment climate, governments can also consider other direct support programs targeted to MSMEs and specific sectors that could compensate for a poor business environment in the short run. Targeted support programs might benefit from taking into account sectoral potential for job creation. One measure that could help guide sectoral targeting is to consider the labor intensity in different sectors. Light manufacturing (food) firms, for example, are important for their contribution to aggregate employment but are among the firms with higher potential for productivity gains. An alternative to ex-ante targeting, is also to identify emerging successful firms or sectors and consider policies to alleviate the constraints specific to those firms/sectors, like for example those operating in the chemicals and construction industries.

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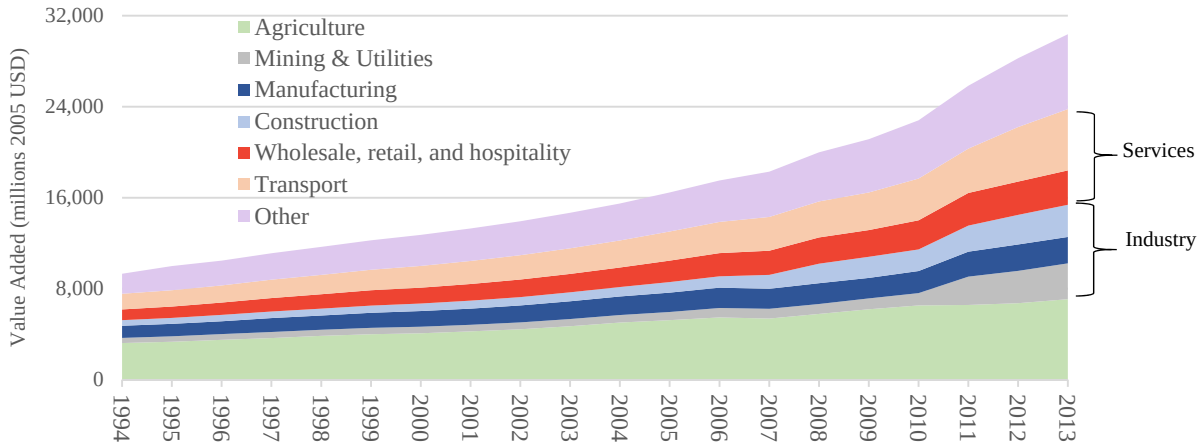
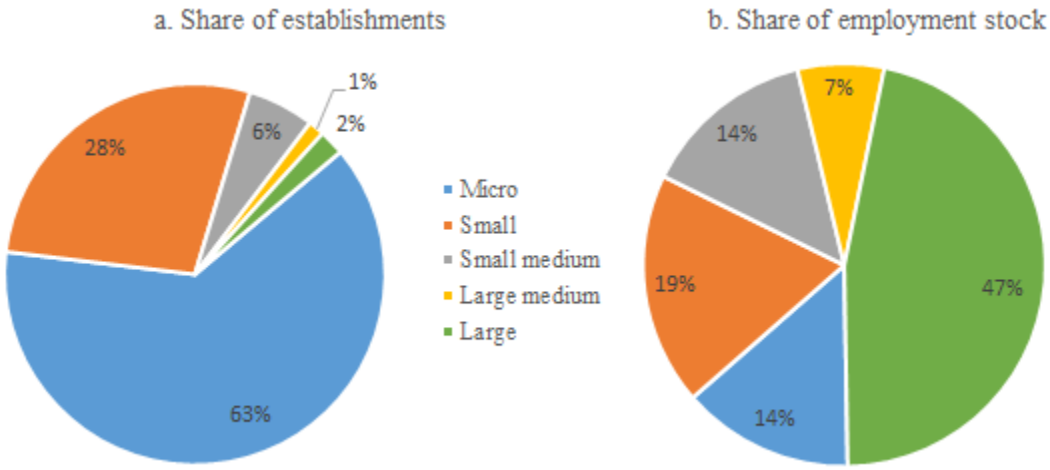
Figure 1: The Economic Structure of Ghana Has Changed toward Services



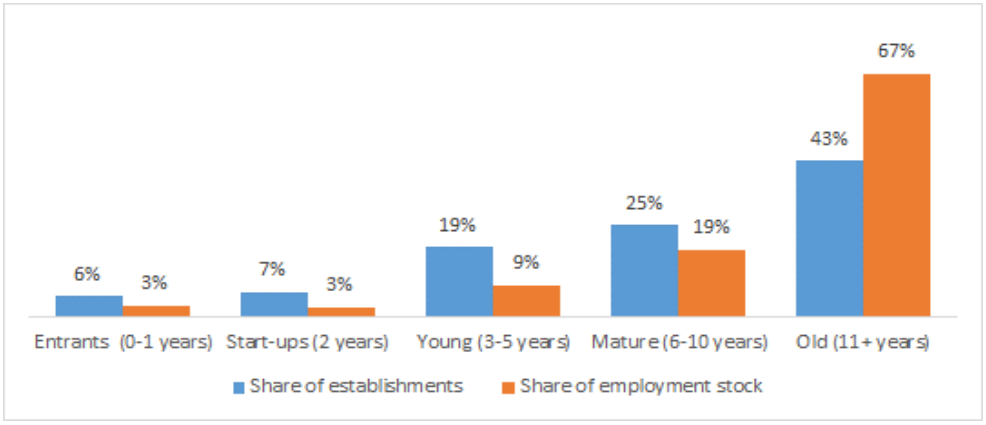
Source: United Nations National Accounts. Real Value Added by Sector, 1994-2013 (2005 USD).

Figure 2: Large Firms Employ Much of the Formal Private Workforce



Source: World Bank Ghana Enterprise Survey 2013. The size categorization refers to the average number of permanent and temporary employees.

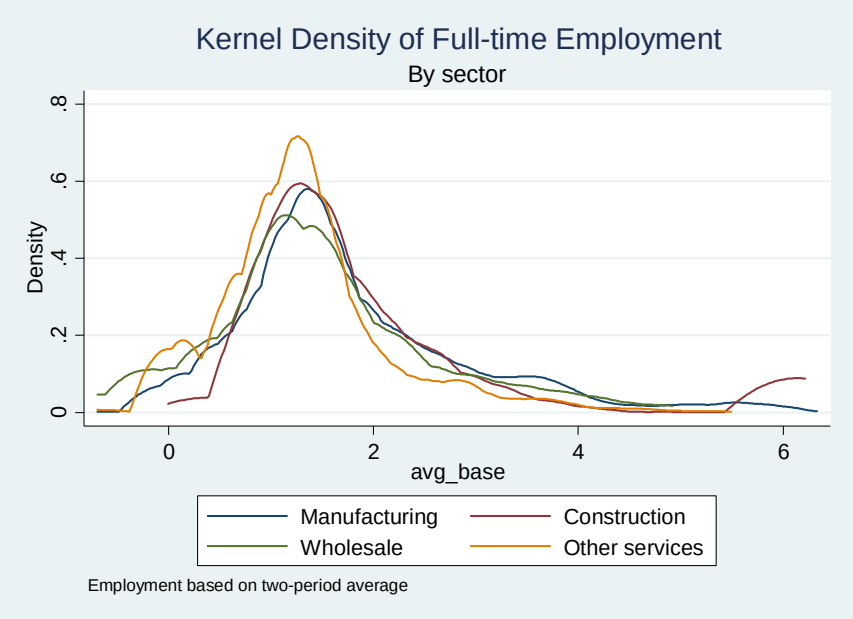
Figure 3. Formal Employment Is Concentrated in Older Firms



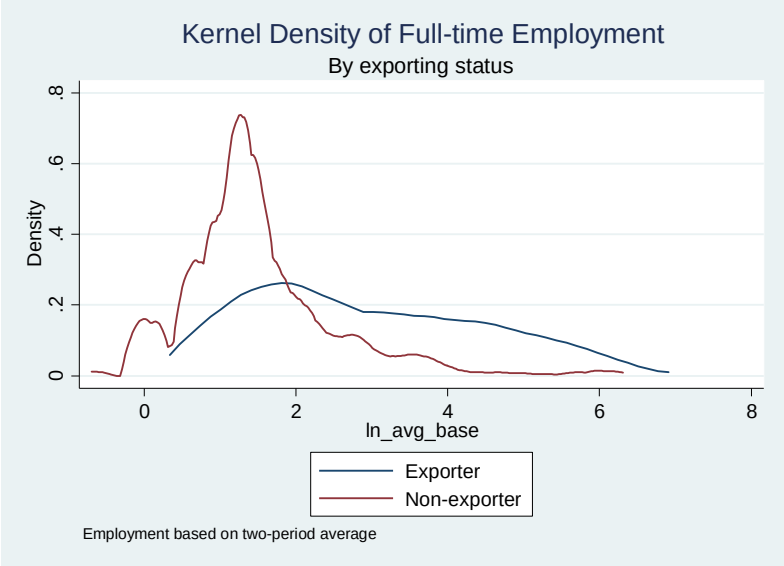
Source: WB Ghana Enterprise Survey 2013.

Fig.4. Permanent employment distribution by sector, exporting status and firm location

a: Employment density by sector



b: Employment density by firms' exporting status



c: Employment density by firms' location

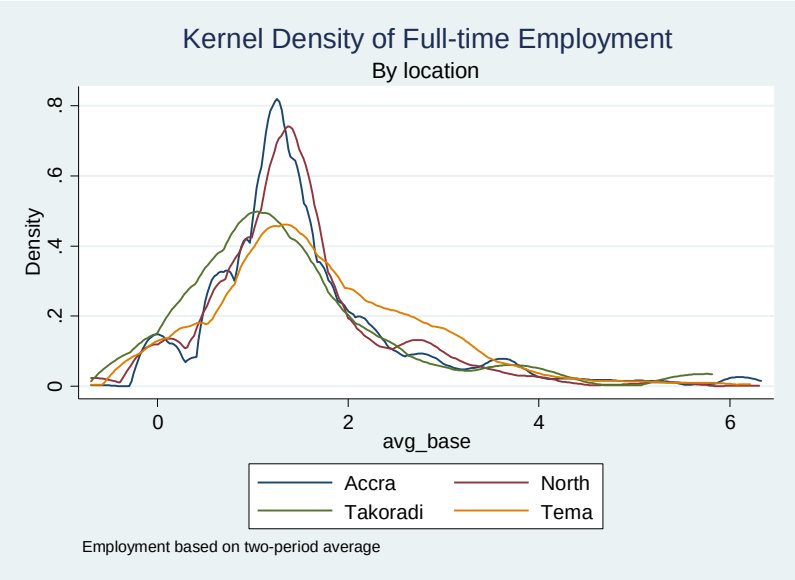
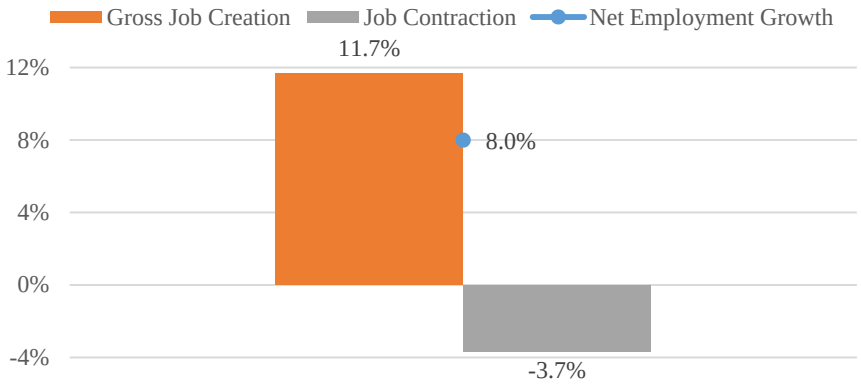


Fig. 5. Large Firms Account for Most of the Aggregate Net Job Creation



Source: WB Ghana Enterprise Survey 2013.

Fig. 6. Lifecycle of firms by Size at Birth

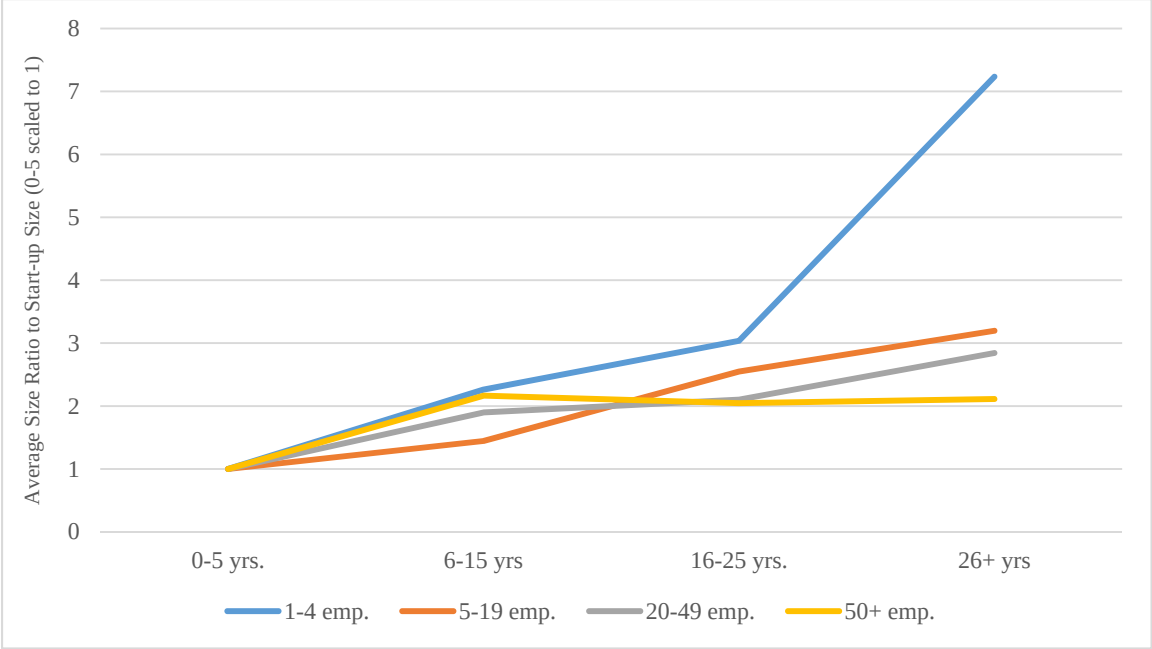


Table 1. Summary Statistics

	Mean	Median	Min.	Max.
Size, FY2012 (log)	2.53	2.20	0.69	8.01
Size ratio	2.19	1.06	0.02	191.50
Labor Productivity, FY2012 (log)*	15.95	17.42	6.91	20.79
Wage bill per worker (log)*	13.46	15.22	4.86	16.76
Size, Start-up (log)	2.01	1.79	0.69	8.00
Age (as of 2010)	2.18	2.30	0.00	4.32
Exports 10+% of Sales	0.08	0.00	0.00	1.00
Foreign ownership 10+%	0.07	0.00	0.00	1.00
Workers with secondary education	0.66	0.80	0.00	1.00
Manager's experience (years)	14.53	13.00	1.00	64.00

*Monetary values are in local currency, Ghanaian Cedi. All estimates are survey-weighted.

Table 2: Service Sectors Account for Lower Shares of Formal Employment

		Share of Employment Stock	Share of Establishments
Industry	Food	8	5
	Metals, Machinery & Equip.	7	7
	Chemicals, Rubber & Plastics	20	5
	Garments	1	2
	Construction	20	6
	Other manufacturing	17	21
Services	Wholesale	5	26
	Retail	10	21
	Other services	12	7
		100%	100%
Location	Accra	60	54
	North	14	22
	Takoradi	13	10
	Tema	14	14

Source: WB Ghana Enterprise Survey 2013.

Table 3: Job Growth and Contraction Rates by Size

a. By firm size

Rates	Gross Job Creation	Job Contraction	Net Employment Growth
Micro (1-5)	2.2%	-0.4%	1.8%
Small (5-19)	1.8%	-1.8%	-0.1%
Sm. Medium (20-49)	1.7%	-0.9%	0.8%
Lg. Medium (50-99)	0.8%	-0.1%	0.7%
Large (100+)	5.3%	-0.5%	4.7%
	11.7%	-3.7%	8.0%
Share			
Micro (1-5)	18.5%	9.9%	22.5%
Small (5-19)	15.3%	49.8%	-0.7%
Sm. Medium (20-49)	14.4%	24.6%	9.7%
Lg. Medium (50-99)	6.7%	1.6%	9.1%
Large (100+)	45.1%	14.1%	59.4%

b. By firm age

Rates	Gross Job Creation	Job Contraction	Net Employment Growth
Young	4.8%	-0.5%	4.3%
Mid-age	2.1%	-0.9%	1.1%
Mature	4.8%	-2.2%	2.6%
	11.7%	-3.7%	8.0%
Share			
Young	41.4%	14.1%	54.0%
Mid-age	17.7%	25.6%	14.0%
Mature	40.9%	60.3%	32.0%

c. By firm's sector

Rates	Gross Job Creation	Job Contraction	Net Employment Growth
Metals	0.6%	-0.3%	0.4%
Chemicals, Plastics & Rubber	2.6%	-0.1%	2.6%
Food	2.6%	-0.2%	2.4%
Garments	0.0%	-0.1%	-0.1%
Other Manufacturing	2.0%	-1.8%	0.2%
Construction	0.8%	-0.1%	0.7%
Retail	1.2%	-0.5%	0.7%
Wholesale	0.5%	-0.2%	0.3%
Other Services	1.3%	-0.5%	0.8%
	11.7%	-3.7%	8.0%
Share			
Metals	5.4%	7.2%	4.6%
Chemicals, Plastics & Rubber	22.5%	2.1%	32.0%
Food	22.7%	5.4%	30.6%
Garments	0.1%	1.9%	-0.7%
Other Manufacturing	16.7%	48.0%	2.3%
Construction	6.9%	3.1%	8.7%
Retail	9.9%	13.2%	8.4%
Wholesale	4.5%	4.8%	4.3%
Other Services	11.2%	14.3%	9.8%

Table 4: Survey-weighted Regressions, Size (2012), log (survey weighted)

	[1]	[2]	[3]	[4]	[5]	[6]
	OLS	OLS	OLS	OLS, excl large	OLS, excl micro	Quantile
Labor Productivity, FY2012 (log)		0.048***	0.036**	0.029*	0.075***	0.014
		(0.016)	(0.016)	(0.015)	(0.027)	(0.009)
Size, Start-up (log)	0.657***	0.600***	0.684***	0.621***	0.493***	0.647***
	(0.089)	(0.105)	(0.041)	(0.037)	(0.060)	(0.031)
Age 6-10	0.086*	0.104*	0.081	0.084	0.133	0.027
	(0.051)	(0.057)	(0.058)	(0.053)	(0.133)	(0.033)
Age 11-20	0.157**	0.254***	0.233***	0.226***	0.270**	0.211***
	(0.061)	(0.052)	(0.054)	(0.052)	(0.112)	(0.040)
Age 20+	0.450***	0.372***	0.254**	0.267**	0.216	0.174***
	(0.147)	(0.101)	(0.116)	(0.118)	(0.161)	(0.051)
Metals, Machinery & Equip.	0.135**	0.192***	0.175***	0.148**	0.052	0.221***
	(0.067)	(0.063)	(0.062)	(0.060)	(0.125)	(0.065)
Chemicals, Rubber & Plastics	0.391***	0.429**	0.262*	0.255*	0.398**	0.228**
	(0.149)	(0.168)	(0.147)	(0.146)	(0.201)	(0.090)
Construction	0.230	-0.030	-0.006	0.026	-0.108	0.000
	(0.353)	(0.097)	(0.087)	(0.084)	(0.147)	(0.063)
Food	0.074	0.136	0.144	0.098	0.206	0.067
	(0.126)	(0.132)	(0.124)	(0.082)	(0.176)	(0.111)
Garments	-0.344***	-0.282**	-0.241**	-0.251***	-1.116***	-0.161
	(0.088)	(0.114)	(0.104)	(0.093)	(0.273)	(0.114)
Other Manuf.	0.047	0.094	0.066	0.066	-0.010	0.058
	(0.056)	(0.065)	(0.072)	(0.071)	(0.136)	(0.050)
Retail	-0.066	-0.054	-0.013	-0.032	0.024	-0.012
	(0.060)	(0.066)	(0.049)	(0.048)	(0.138)	(0.022)
Wholesale	-0.001	-0.011	-0.009	-0.011	0.040	0.000
	(0.062)	(0.070)	(0.070)	(0.070)	(0.140)	(0.091)
North	-0.128**	-0.100*	-0.094*	-0.082	-0.013	-0.117**
	(0.055)	(0.054)	(0.053)	(0.051)	(0.122)	(0.053)
Takoradi	-0.039	-0.051	-0.079	-0.078	0.093	-0.085
	(0.065)	(0.081)	(0.089)	(0.083)	(0.246)	(0.068)
Tema	0.090	0.079	0.056	0.068	0.065	0.020
	(0.058)	(0.059)	(0.054)	(0.044)	(0.089)	(0.027)
Exports 10+% of Sales	0.502***	0.516***	0.383***	0.256*	0.370*	0.345*
	(0.157)	(0.169)	(0.147)	(0.133)	(0.205)	(0.176)
Foreign ownership 10+%			0.310**	0.243**	0.492***	0.419***
			(0.123)	(0.117)	(0.134)	(0.129)
Workers with secondary education (%)			0.008	0.011	-0.033	-0.007
			(0.072)	(0.068)	(0.118)	(0.030)
Manager's experience (years)			0.003	0.003	0.001	0.003
			(0.003)	(0.003)	(0.005)	(0.002)
Constant	0.694***	0.288	0.255*	0.406***	0.509*	0.502***
	(0.121)	(0.187)	(0.146)	(0.139)	(0.266)	(0.089)
Observations	1,227	975	931	910	441	931
R-squared	0.498	0.522	0.593	0.526	0.471	..

*** p<0.01, ** p<0.05, * p<0.1. The omitted reference categories for fixed effects are: young (1-5 yrs.), other services, and Accra. Columns 1-5 use Stata's svy: prefix and include linearized Taylor standard errors. Col. 6 is a quantile regression estimating the sample median, using survey-weighted estimates.

Table 5, Labor Productivity (log) 2012, survey-weighted

	[1] OLS	[2] OLS, excl large	[3] OLS, excl micro
Micro	-1.051**	-1.176	
	(0.459)	(0.732)	
Small	-1.094**	-1.220*	-1.248***
	(0.453)	(0.732)	(0.442)
Small-medium	-0.931*	-1.070	-1.009**
	(0.475)	(0.757)	(0.458)
Large-medium	0.154		0.144
	(0.783)		(0.780)
Age 6-10	-0.067	-0.063	-0.250
	(0.180)	(0.173)	(0.263)
Age 11-20	-0.153	-0.164	-0.624**
	(0.190)	(0.193)	(0.268)
Age 20+	-0.081	-0.108	-0.396
	(0.262)	(0.270)	(0.302)
Metals, Machinery & Equip.	0.049	0.001	0.230
	(0.261)	(0.269)	(0.307)
Chemicals, Rubber & Plastics	-0.222	-0.224	0.122
	(0.451)	(0.478)	(0.470)
Construction	0.888*	0.880*	0.260
	(0.456)	(0.462)	(0.535)
Food	-0.237	-0.265	0.179
	(0.324)	(0.243)	(0.348)
Garments	-0.806**	-0.812**	2.870***
	(0.403)	(0.399)	(0.565)
Other Manuf.	-0.273	-0.263	0.013
	(0.200)	(0.202)	(0.272)
Retail	0.099	0.094	0.702**
	(0.197)	(0.200)	(0.330)
Wholesale	0.348	0.319	0.665*
	(0.265)	(0.271)	(0.391)
North	-0.167	-0.179	-0.500**
	(0.212)	(0.216)	(0.246)
Takoradi	-0.701***	-0.740***	-0.686**
	(0.203)	(0.206)	(0.318)
Tema	0.134	0.109	0.464**
	(0.165)	(0.151)	(0.216)
Exports 10+% of Sales	-0.026	0.033	-0.296
	(0.426)	(0.471)	(0.430)
Foreign ownership 10+%	0.883**	0.947**	0.652*
	(0.347)	(0.371)	(0.394)
Workers with secondary education (%)	0.745***	0.764***	0.855***
	(0.211)	(0.210)	(0.272)
Manager's experience (years)	0.007	0.008	0.008
	(0.010)	(0.010)	(0.012)
Constant	10.082***	10.206***	10.206***
	(0.523)	(0.779)	(0.576)
Observations	981	951	483
R-squared	0.127	0.120	0.216

*** p<0.01, ** p<0.05, * p<0.1. The omitted reference categories for fixed effects are: young (1-5 yrs.), other services, Accra, and large (100+ emp.); in col. 2, large-medium is the excluded size category. All columns Stata's svy: prefix and include linearized Taylor standard errors.

Table 6: Firm Growth Measures (survey weighted)

	[1]	[2]	[3]	[4]
	Size ratio (FY2012 size to start-up)			Emp. Growth
Labor Productivity, FY2012 (log)		0.167*	0.124**	-0.002
		(0.092)	(0.056)	(0.006)
Size, Start-up (log)	-0.414	-0.762***	-0.884**	
	(0.266)	(0.252)	(0.432)	
Size, FY2010 (log)				-0.176***
				(0.018)
Age 6-10	0.797***	0.985***	0.956***	-0.119***
	(0.199)	(0.161)	(0.191)	(0.027)
Age 11-20	1.051**	1.629***	1.466***	-0.091***
	(0.457)	(0.217)	(0.366)	(0.026)
Age 20+	4.011**	2.531***	2.003***	-0.032
	(1.993)	(0.928)	(0.569)	(0.041)
Metals, Machinery & Equip.	0.042	0.258	0.224	0.056
	(0.221)	(0.189)	(0.217)	(0.039)
Chemicals, Rubber & Plastics	0.493	0.849	0.226	0.220***
	(0.493)	(0.527)	(0.356)	(0.072)
Construction	3.781	-0.455	-0.385	0.053
	(4.554)	(0.290)	(0.318)	(0.034)
Food	-0.170	0.131	0.137	0.125**
	(0.311)	(0.285)	(0.333)	(0.059)
Garments	-0.422	-0.343	-0.306	-0.144***
	(0.313)	(0.356)	(0.316)	(0.044)
Other Manuf.	0.364	0.677	0.719	0.055**
	(0.376)	(0.501)	(0.526)	(0.027)
Retail	-0.077	0.075	0.013	0.027
	(0.315)	(0.283)	(0.262)	(0.026)
Wholesale	-0.114	-0.036	-0.147	0.037
	(0.224)	(0.223)	(0.286)	(0.045)
North	-0.237	0.032	0.002	-0.057**
	(0.342)	(0.297)	(0.238)	(0.029)
Takoradi	-0.512	-0.217	-0.307	0.009
	(0.386)	(0.232)	(0.240)	(0.036)
Tema	-0.191	0.005	-0.025	0.031
	(0.344)	(0.211)	(0.218)	(0.028)
Exports 10+% of Sales	0.773	1.448	1.181	0.150***
	(1.107)	(1.000)	(1.117)	(0.045)
Foreign ownership 10+%			1.717	0.172***
			(1.816)	(0.040)
Workers with secondary education (%)			0.399	-0.020
			(0.361)	(0.031)
Manager's experience (years)			0.019	-0.001
			(0.037)	(0.001)
Constant	1.554***	0.202	0.310	0.441***
	(0.318)	(0.663)	(0.601)	(0.076)
Observations	1,228	974	931	926
R-squared	0.083	0.054	0.057	0.384

*** p<0.01, ** p<0.05, * p<0.1. The omitted reference categories for fixed effects are: young (1-5 yrs.), other services, and Accra. All columns Stata's svy: prefix and include linearized Taylor standard errors.

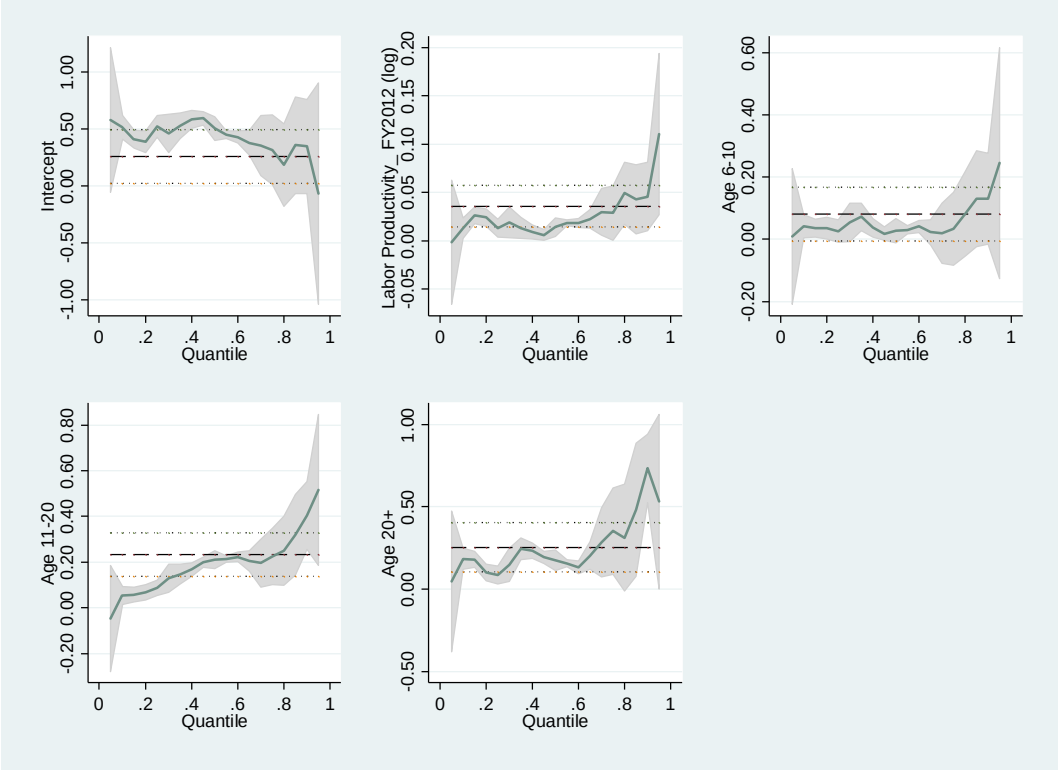
Table 7: Wage bill per worker (log), 2012 survey-weighted

	[1] OLS	[2] OLS, excl large	[3] OLS, excl micro
Labor Productivity, FY2012 (log)	0.509***	0.509***	0.609***
	(0.024)	(0.024)	(0.035)
Micro	-0.456*	-0.310	
	(0.252)	(0.364)	
Small	-0.390	-0.250	-0.122
	(0.252)	(0.363)	(0.245)
Small-medium	-0.512*	-0.372	-0.301
	(0.262)	(0.383)	(0.253)
Large-medium	-0.150		-0.141
	(0.408)		(0.385)
Age 6-10	-0.116	-0.095	-0.014
	(0.094)	(0.094)	(0.177)
Age 11-20	-0.006	0.020	0.088
	(0.105)	(0.108)	(0.178)
Age 20+	-0.144	-0.095	0.018
	(0.150)	(0.155)	(0.212)
Metals, Machinery & Equip.	-0.079	-0.076	-0.313*
	(0.123)	(0.126)	(0.166)
Chemicals, Rubber & Plastics	0.147	0.194	-0.187
	(0.195)	(0.202)	(0.275)
Construction	0.069	0.071	-0.168
	(0.224)	(0.225)	(0.261)
Food	0.050	0.004	-0.072
	(0.171)	(0.161)	(0.201)
Garments	-0.172	-0.178	-0.247
	(0.127)	(0.128)	(0.368)
Other Manuf.	-0.065	-0.053	-0.229
	(0.103)	(0.104)	(0.159)
Retail	-0.089	-0.085	-0.488**
	(0.089)	(0.090)	(0.198)
Wholesale	0.043	0.054	-0.032
	(0.155)	(0.160)	(0.267)
North	-0.123	-0.126	-0.410**
	(0.091)	(0.093)	(0.171)
Takoradi	-0.156	-0.158	-0.352
	(0.134)	(0.133)	(0.263)
Tema	0.003	0.003	-0.007
	(0.090)	(0.090)	(0.148)
Exports 10+% of Sales	-0.012	0.045	0.001
	(0.221)	(0.240)	(0.286)
Foreign ownership 10+%	-0.127	-0.184	0.038
	(0.174)	(0.183)	(0.188)
Workers with secondary education (%)	0.250**	0.254**	0.059
	(0.107)	(0.107)	(0.171)
Manager's experience (years)	-0.006	-0.007	-0.006
	(0.005)	(0.005)	(0.007)
Constant	2.949***	2.812***	2.021***
	(0.381)	(0.444)	(0.470)
Observations	902	873	450
R-squared	0.539	0.536	0.586

*** p<0.01, ** p<0.05, * p<0.1. The omitted reference categories for fixed effects are: young (1-5 yrs.), other services, Accra, and large (100+ emp.); in col. 2, large-medium is the excluded size category. All columns Stata's svy: prefix and include linearized Taylor standard errors.

Annex

Figure A.1: Graph of selected coefficients over quantiles of size (log) distribution



Note: coefficients correspond to table 4, col. 6 and are produced using the Stata command grqreg.

Table A.1a. Quantile Regression Coefficients

Percentile of Size (log) Distribution	Quantile Regression Coefficient	p-value
10th	0.013	0.333
25th	0.013	0.049**
Median[+]	0.014	0.109
75th	0.029	0.138
90th	0.046	0.063*

[+] Corresponds to output in Table 4, col. 6

Table A.1: Employment-weighted Regressions, Size (2012), log

	[1]	[2]	[3]	[4]	[5]	[6]
	OLS	OLS	OLS	OLS, excl large	OLS, excl micro	Quantile
Labor Productivity, FY2012 (log)		0.104**	0.101**	0.072***	0.129**	0.098*
		(0.044)	(0.043)	(0.027)	(0.051)	(0.055)
Size, Start-up (log)	0.734***	0.692***	0.679***	0.565***	0.546***	0.719***
	(0.073)	(0.093)	(0.108)	(0.065)	(0.128)	(0.127)
Age 6-10	0.285*	0.421***	0.462***	0.280*	0.430*	0.472*
	(0.151)	(0.158)	(0.168)	(0.152)	(0.233)	(0.243)
Age 11-20	0.596***	0.565***	0.550**	0.432***	0.413*	0.554***
	(0.171)	(0.170)	(0.219)	(0.120)	(0.240)	(0.200)
Age 20+	1.020***	0.496**	0.611**	0.382	0.391	0.743*
	(0.214)	(0.231)	(0.293)	(0.255)	(0.313)	(0.410)
Metals, Machinery & Equip.	0.192	0.212	0.253	-0.062	0.274	0.160
	(0.237)	(0.218)	(0.236)	(0.166)	(0.294)	(0.159)
Chemicals, Rubber & Plastics	0.423	0.707**	0.643*	0.225	0.703	0.505
	(0.276)	(0.299)	(0.379)	(0.284)	(0.440)	(1.066)
Construction	2.152***	-0.327	-0.265	-0.176	-0.408	-0.332
	(0.420)	(0.247)	(0.250)	(0.234)	(0.311)	(0.255)
Food	0.279	0.500**	0.576**	0.212	0.526*	0.644**
	(0.247)	(0.252)	(0.260)	(0.198)	(0.303)	(0.263)
Garments	-0.835***	-0.745***	-0.681***	-0.710***	-1.806***	-0.532***
	(0.183)	(0.233)	(0.221)	(0.185)	(0.485)	(0.185)
Other Manuf.	-0.090	0.128	0.158	0.035	0.058	0.198
	(0.225)	(0.251)	(0.256)	(0.212)	(0.317)	(0.131)
Retail	-0.067	0.018	-0.010	-0.246	0.063	-0.178
	(0.251)	(0.265)	(0.240)	(0.182)	(0.365)	(0.115)
Wholesale	-0.099	0.015	-0.031	-0.127	-0.016	0.130
	(0.208)	(0.189)	(0.186)	(0.160)	(0.248)	(0.244)
North	-0.457***	-0.311*	-0.328*	-0.073	-0.302	-0.183**
	(0.168)	(0.174)	(0.186)	(0.139)	(0.227)	(0.091)
Takoradi	-0.128	0.092	0.011	0.093	0.151	0.276
	(0.210)	(0.265)	(0.301)	(0.279)	(0.392)	(0.456)
Tema	-0.081	-0.006	-0.069	0.077	-0.177	-0.002
	(0.182)	(0.153)	(0.154)	(0.107)	(0.187)	(0.131)
Exports 10+% of Sales	0.641**	0.703**	0.599	0.285**	0.598	0.348
	(0.318)	(0.332)	(0.407)	(0.137)	(0.399)	(0.350)
Foreign ownership 10+%			0.288	0.244*	0.240	0.268
			(0.312)	(0.128)	(0.333)	(0.370)
Workers with secondary education (%)			0.240	0.089	0.139	0.286
			(0.193)	(0.138)	(0.248)	(0.237)
Manager's experience (years)			-0.004	0.001	-0.002	-0.007
			(0.013)	(0.006)	(0.014)	(0.016)
Constant	0.968***	-0.074	-0.177	0.374	0.236	-0.369
	(0.186)	(0.406)	(0.482)	(0.327)	(0.621)	(0.698)
Observations	1,227	975	931	910	441	931
R-squared	0.735	0.722	0.723	0.515	0.642	..

*** p<0.01, ** p<0.05, * p<0.1. The omitted reference categories for fixed effects are: young (1-5 yrs.), other services, and Accra. Columns 1-5 use Stata's svy: prefix and include linearized Taylor standard errors. Col. 6 is a quantile regression estimating the sample median, using employment-weighted estimates.

Table A.2, Labor Productivity (log) 2012, employment-weighted

	[1] OLS	[2] OLS, excl large	[3] OLS, excl micro
Micro	-1.492***	-1.333**	
	(0.400)	(0.663)	
Small	-1.445***	-1.226*	-1.454***
	(0.373)	(0.660)	(0.356)
Small-medium	-1.335***	-1.114	-1.298***
	(0.422)	(0.706)	(0.411)
Large-medium	-0.158		-0.101
	(0.743)		(0.758)
Age 6-10	-0.181	0.066	-0.349
	(0.271)	(0.241)	(0.403)
Age 11-20	-0.055	-0.293	-0.243
	(0.291)	(0.291)	(0.415)
Age 20+	0.404	0.032	0.315
	(0.390)	(0.421)	(0.447)
Metals, Machinery & Equip.	0.558	0.071	0.695
	(0.394)	(0.388)	(0.492)
Chemicals, Rubber & Plastics	-0.022	0.139	0.084
	(0.468)	(0.705)	(0.548)
Construction	0.568	0.529	0.305
	(0.464)	(0.446)	(0.561)
Food	0.159	-0.392	0.182
	(0.504)	(0.500)	(0.589)
Garments	-0.499	-0.621	2.905***
	(0.689)	(0.702)	(0.645)
Other Manuf.	-0.399	-0.236	-0.338
	(0.350)	(0.293)	(0.417)
Retail	0.558*	0.458	1.033**
	(0.288)	(0.278)	(0.432)
Wholesale	0.519	0.249	0.586
	(0.446)	(0.416)	(0.612)
North	-0.059	-0.377	-0.080
	(0.259)	(0.258)	(0.342)
Takoradi	-0.097	-1.075***	0.074
	(0.568)	(0.333)	(0.721)
Tema	0.538**	0.298	0.648**
	(0.260)	(0.254)	(0.309)
Exports 10+% of Sales	-0.485	-0.628	-0.529
	(0.361)	(0.413)	(0.322)
Foreign ownership 10+%	0.416	0.579	0.393
	(0.349)	(0.447)	(0.339)
Workers with secondary education (%)	0.401	0.856***	0.245
	(0.303)	(0.304)	(0.407)
Manager's experience (years)	0.008	0.007	0.012
	(0.011)	(0.014)	(0.013)
Constant	10.460***	10.303***	10.492***
	(0.596)	(0.750)	(0.762)
Observations	981	951	483
R-squared	0.269	0.193	0.291

*** p<0.01, ** p<0.05, * p<0.1. The omitted reference categories for fixed effects are: young (1-5 yrs.), other services, Accra, and large (100+ emp.); in col. 2, large-medium is the excluded size category. All columns Stata's svy: prefix and include linearized Taylor standard errors.

Table A.3: Firm Growth Measures (employment weighted)

	[1]	[2]	[3]	[4]
	Size ratio (FY2012 size to start-up)			Emp. Growth
Labor Productivity, FY2012 (log)		1.670	1.216*	0.005
		(1.266)	(0.728)	(0.005)
Size, Start-up (log)	-3.505**	-4.263	-5.193	
	(1.731)	(2.816)	(3.547)	
Size, FY2010 (log)	1.880	3.155***	3.971**	-0.089***
	(1.855)	(1.201)	(1.697)	(0.031)
Age 6-10	5.029**	5.508**	4.015	-0.115***
	(2.043)	(2.188)	(4.155)	(0.026)
Age 11-20	17.874***	10.777	11.543*	-0.121***
	(5.486)	(6.954)	(6.274)	(0.032)
Age 20+	4.711*	3.358	5.147	0.040
	(2.733)	(3.158)	(4.467)	(0.042)
Metals, Machinery & Equip.	-0.170	1.547	-0.357	0.104**
	(3.051)	(2.492)	(3.017)	(0.044)
Chemicals, Rubber & Plastics	32.355***	-1.333	0.039	-0.005
	(6.849)	(1.729)	(2.683)	(0.038)
Construction	1.491	3.471	5.151	0.196**
	(3.011)	(4.020)	(4.879)	(0.097)
Food	-3.334	-3.344**	-1.100	-0.124***
	(2.055)	(1.572)	(2.627)	(0.046)
Garments	3.716	7.772	9.321	0.002
	(5.916)	(8.549)	(8.875)	(0.030)
Other Manuf.	0.056	1.408	3.122	0.019
	(3.628)	(4.164)	(4.069)	(0.029)
Retail	-1.006	-1.495	-2.614	0.001
	(1.656)	(1.543)	(2.136)	(0.032)
Wholesale	-6.005*	-5.310	-3.340	-0.067*
	(3.554)	(4.620)	(2.450)	(0.037)
North	-6.931**	-2.966	-1.833	0.000
	(3.302)	(3.913)	(2.391)	(0.062)
Takoradi	-4.925**	-2.210	-3.685	-0.007
	(2.388)	(2.002)	(2.944)	(0.027)
Tema	5.201	5.167	0.527	0.051
	(4.724)	(4.753)	(9.120)	(0.031)
Exports 10+% of Sales			11.299	0.073***
			(11.606)	(0.024)
Foreign ownership 10+%			6.128	-0.009
			(4.629)	(0.037)
Workers with secondary education (%)			0.189	-0.002
			(0.350)	(0.001)
Manager's experience (years)				-0.038**
				(0.018)
Constant	8.473**	-7.573	-10.691	0.204**
	(3.441)	(7.339)	(9.373)	(0.099)
Observations	1,228	974	931	926
R-squared	0.617	0.146	0.218	0.266

*** p<0.01, ** p<0.05, * p<0.1. The omitted reference categories for fixed effects are: young (1-5 yrs.), other services, and Accra. All columns Stata's svy: prefix and include linearized Taylor standard errors.

Table A.4: Wage bill per worker (log), 2012 employment-weighted

	[1]	[2]	[3]
Labor Productivity, FY2012 (log)	0.583***	0.588***	0.609***
	(0.044)	(0.037)	(0.047)
Micro	-0.121	-0.127	
	(0.223)	(0.291)	
Small	-0.013	-0.080	0.044
	(0.239)	(0.289)	(0.231)
Small-medium	-0.175	-0.293	-0.111
	(0.266)	(0.308)	(0.267)
Large-medium	0.054		0.070
	(0.415)		(0.424)
Age 6-10	-0.315**	0.027	-0.354*
	(0.129)	(0.137)	(0.192)
Age 11-20	-0.298**	0.051	-0.333*
	(0.139)	(0.138)	(0.189)
Age 20+	-0.467*	0.074	-0.458
	(0.269)	(0.197)	(0.297)
Metals, Machinery & Equip.	-0.223	-0.103	-0.316
	(0.167)	(0.158)	(0.219)
Chemicals, Rubber & Plastics	-0.212	0.259	-0.341
	(0.306)	(0.305)	(0.337)
Construction	-0.031	0.029	-0.092
	(0.240)	(0.217)	(0.289)
Food	0.299	-0.041	0.230
	(0.185)	(0.168)	(0.224)
Garments	-0.170	-0.279*	0.190
	(0.198)	(0.165)	(0.432)
Other Manuf.	-0.207	-0.109	-0.255
	(0.214)	(0.168)	(0.257)
Retail	-0.219	-0.187	-0.354
	(0.174)	(0.145)	(0.291)
Wholesale	-0.075	0.165	-0.143
	(0.227)	(0.266)	(0.313)
North	-0.259	-0.221	-0.423*
	(0.170)	(0.144)	(0.237)
Takoradi	-0.141	0.042	-0.220
	(0.231)	(0.222)	(0.309)
Tema	0.069	0.195	0.046
	(0.126)	(0.137)	(0.152)
Exports 10+% of Sales	-0.386	-0.034	-0.352
	(0.339)	(0.261)	(0.360)
Foreign ownership 10+%	0.299	-0.149	0.307
	(0.253)	(0.204)	(0.261)
Workers with secondary education (%)	-0.001	0.080	-0.124
	(0.177)	(0.156)	(0.235)
Manager's experience (years)	0.010	-0.007	0.010
	(0.011)	(0.007)	(0.013)
Constant	2.103***	1.958***	1.996***
	(0.556)	(0.419)	(0.594)
Observations	902	873	450
R-squared	0.614	0.605	0.631

*** p<0.01, ** p<0.05, * p<0.1. The omitted reference categories for fixed effects are: young (1-5 yrs.), other services, Accra, and large (100+ emp.); in col. 2, large-medium is the excluded size category. All columns Stata's svy: prefix and include linearized Taylor standard errors.