

Small vs. Young Firms across the World

Contribution to Employment, Job Creation, and Growth

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Abstract

This paper investigates the contribution of small firms to employment, job creation, and growth in developing countries. While small firms (< 20 employees) have the smallest share of aggregate employment, the SME sector's (<100 employees) contribution is comparable to that of large firms. Small firms have the largest shares of

job creation, and highest sales growth and employment growth, even after controlling for firm age. Large firms, however, have higher productivity growth. Conditional on size, young firms are the fastest growing and large mature firms have the largest employment shares but small young firms have higher job creation rates.

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Introduction

The role played by small and medium enterprises (SMEs) in employment generation and economic recovery is a key question for policy makers. Multi-billion dollar aid portfolios across countries are directed at fostering the growth of SMEs. However, there is little systematic research/data, informing the various policies in support of SMEs, especially in developing countries. Moreover, the empirical evidence that exists on the firm-size growth relationship has been mixed and we do not know whether SMEs or other firms are significant contributors to the creation of jobs, and how this varies across countries.

In this paper, we first present comprehensive statistics on the contribution of SMEs to total employment, job creation, and growth in the formal sector across 104 developing economies. The data compiled are more comprehensive and more comparable across countries than existing cross-country SME databases (e.g. Ayyagari, Beck, and Demirguc-Kunt, 2007). We then examine the relationship between firm size, employment, and productivity growth and how this varies with country income.

Our sample consists of 49,370 firms in 104 countries, surveyed over the period 2006-2010. We focus on the formal sector since studies (e.g. La Porta and Shleifer, 2008) have shown that while informal firms account for a large portion of economic activity in developing countries, growth and development comes from the creation of highly productive formal firms.¹ Informal firms have been shown to be small and extremely unproductive compared to even small firms in developing countries.

¹ This empirical evidence fits in with the dual economy view originally associated with Harris and Todaro (1970) that suggests that the informal economy provides a social safety net until the establishment of formal productive firms that provide jobs and contribute to growth and development.

Our analysis shows that small firms are the smallest contributors to employment across countries but the SME sector's employment contribution is comparable to that of large firms. In the median country, firms with <20 employees employ only 16.48% of the total permanent, full-time employment in the country.² The mean across our sample of countries is 20.21%. However, when we consider both small and medium enterprises (i.e. <99 employees), the mean and median employment shares are 47.94% and 45.45% respectively. The corresponding mean and median employment shares for large firms (100+ employees) are similar at 52.06% and 54.55% respectively.

We also find a negative association between GDP/capita and small firm contribution to employment – small firms contribute more to employment in low income countries than high income countries. Other studies, such as Klapper and Love (2010), find a strong positive relation between firm births and income per capita. Taken together, these findings suggest that high income countries are characterized by high rates of entry and turnover of small firms rather than a large SME sector.

While small firms do not employ the largest number of people, they generate the most new jobs, across country income groups. When we look at median statistics across the sample of countries that had a net positive job creation across all firms in the country, small firms with less than 20 employees generate 45.34% of the jobs. Even in countries that had an aggregate net job loss, we find small firms with less than 20 employees to be significant job creators (36.54%).

We also find that the small firms have the highest employment growth and sales growth rates in regressions controlling for firm age, country, industry, and year fixed effects. However, small firms' higher employment and sales growth is not accompanied by productivity growth.

² Note that we do not have micro enterprises, that is, firms with less than 5 employees, in our sample.

Large firms have higher productivity growth. Our results are robust to sub-sample analysis by country income group and by looking at countries with large versus small informal sectors.

When we examine the role of age conditional on firm size, we find that while large mature firms (firms with over 100 employees and 11+ years) have the largest proportional share of total employment compared to other size-age groupings, job creation rates are highest amongst small young firms (firms with <20 employees and ≤ 5 years old). We also find that young firms (≤ 5 years) have higher employment growth, sales growth, and productivity growth rates than older firms in regressions controlling for firm size, country, industry, and year fixed effects.

Our cross-country database improves upon existing databases along several dimensions. First, the data are comparable across countries since they are all sourced from the World Bank Enterprise Surveys (ES) database which samples formally registered firms from over 100 countries to study the business climate constraints to private sector growth and performance. The surveys use standardized survey instruments and a uniform sampling methodology to minimize measurement error and to yield data that are comparable across countries.³ Second, for the first time ever, we are able to compute statistics on SMEs for a large sample of developing countries. While statistics on size distribution are more easily available for the developed countries from sources such as the OECD, there is little to no information available for many developing countries. Finally, the data set allows us to compute contribution to total employment, labor productivity, and employment generation across the entire size distribution and conditional on size, we can also compare the role of young versus mature firms.

³ The mean response rate across our sample of countries is 70% which is superior to most other survey based studies. For instance, Campello, Giambona, Graham, and Harvey (2010) report response rates of 3 to 7% in their survey of how companies use credit lines during a financial crisis. Other studies in corporate finance report response rates between 7%-9% including Graham and Harvey (2001), Brav, Graham, Harvey and Michaelu (2005), Graham, Harvey, and Rajgopal (2005), and Lins, Servaes, and Tufano (2010)

Nevertheless, our findings are subject to a number of caveats. Most importantly, enterprise surveys cover only the formal sector, excluding the informal firms. Hence our results do not speak to informal enterprises. In addition we also do not have data on micro enterprises (less than 5 employees) in our sample. Second, we have data only on surviving firms, which probably overestimates the growth rates for very young firms given they tend to have higher failure rates. While this database is the best available at this point, we recognize these limitations.

Overall, our findings contribute to the emerging literature on what types of firms create jobs. Our findings on size and employment share are consistent with the findings in Haltiwanger, Jarmin and Miranda (2010a, 2010b) who find that in the US, large (and mature firms) have the largest share of employment. However we also find that in developing countries, the SME sector as a whole is comparable to large firms in contributing to employment. On job creation, the US evidence suggests that small mature firms have net job losses whereas in developing countries we find that small firms have the largest share of job creation. Moreover, in countries that have had net job losses in the economy as a whole, it is only the small firms that have net job gains.⁴ Our data does not allow us to comment on the contribution of start-ups and young firms that have been shown to be important in the US.

The remainder of the paper is organized as follows. In Section II we describe the data and the indicators used in this paper, and present summary statistics. In Section III, we discuss in

⁴ Haltiwanger et al. (2010a) also find that there is no systematic relation between firm size and growth once age is controlled for. Specifically, they argue that the "systematic inverse relationship between firm size and net growth rates in prior analyses is entirely attributable to most new firms being classified in small size classes." Since surviving new firms grow much faster than older firms in the US, this classification may make it seem that firm size is a determinant of firm growth. By contrast, in our sample of developing countries, we find that small firms are significant contributors to employment growth even after controlling for age.

detail the contribution of small firms to employment, productivity, and job creation in our data. In Section IV, we present growth regressions and sensitivity analysis and place our results in the context of existing literature. Section V concludes.

II. Data and Variable Construction

In this section, we describe the survey dataset and define the various variables used to describe the relative importance of small firms in different countries. We use the World Bank Enterprise Surveys (ES)⁵ that are an on-going initiative of the World Bank to benchmark the investment climate in different countries across the world and to analyze firm behavior and performance. The Enterprise Surveys survey from the universe of eligible firms obtained from the country's statistical office⁶ using stratified random sampling with replacement to generate a sample representative of the whole non-agricultural private economy (so fully government owned firms are excluded from the sampling universe) in the country. The surveys are stratified according to three criteria: *Sector of activity* (population of industries include manufacturing sectors, construction, services, transport, storage, communications, and computer and related activities), *Firm size* (the strata include small firms (5-19 employees),⁷ medium firms (20-99

⁵ The ES surveys and their precursor, the World Business Environment Survey have been used to investigate a series of questions in developmental economics including the relation between property rights and contracting institutions (e.g. Acemoglu and Johnson, 2005; Ayyagari, Demirguc-Kunt, and Maksimovic, 2008a), investment climate and business environment obstacles to growth (e.g. Beck, Demirguc-Kunt, and Maksimovic, 2005; Ayyagari, Demirguc-Kunt, and Maksimovic, 2008b), firm financing patterns (e.g. Beck, Demirguc-Kunt, and Maksimovic, 2008; Cull and Xu, 2005, Ayyagari, Demirguc-Kunt, and Maksimovic, 2010) and dispute resolution via courts (e.g. Djankov, La Porta, Lopez-de-Silanes, and Shleifer, 2003).

⁶ The master list of firms is sometimes obtained from other government agencies such as tax or business licensing authorities. In some cases, the sampling universe is generated from lists maintained by the Chamber of Commerce and business associations or marketing databases where registration is voluntary. In a few cases, the sample frame is created via block enumeration.

⁷ We have a few firms in the sample that report having less than 5 employees. All our results are robust to dropping these firms. Our results are also robust to dropping firms that started out as informal enterprises and were formally registered after starting operations.

employees), and large firms (100 or more employees)), and *Geographical location* (selected based on centers of economic activity in the country).

While the Enterprise Surveys have been produced since 2002, we restrict our sample to surveys administered during 2006-2010 since these provide sampling weights that take care of the varying probabilities of selection across different strata and are thus indispensable to making assertions about the whole population.⁸ For countries that were surveyed twice during this period, we retain data for the year with the largest number of firms surveyed. Our results are also robust to retaining the most recent survey data for each country. Our final sample consists of surveys across 104 countries.

We examine and compare the role of small firms in each country along two dimensions. First we construct the small firm share of **Total Employment** where total employment is the population estimate of the number of permanent, full-time employees in the country derived by aggregating the employment reported each firm in the country multiplied by its sampling weight. Second, we construct the small firm share of **Job Creation** where job creation is the population estimate of the change in the number of permanent, full-time employees over two years, also derived by aggregating the change in employment reported by each firm in the survey multiplied by its sampling weight.⁹

⁸ Most surveys contain three sets of weights – strict, median, and weak weights depending on the eligibility criteria used to construct the sample universe. Under the strict assumption, eligible establishments are those for which it was possible to directly determine eligibility, under the median assumption, eligible establishments are those for which it was possible to directly determine eligibility and those that rejected the screener questionnaire and under the weak assumption only observed non-eligible units were excluded from universe projections. So under the weak assumption, all establishments for which it was not possible to finalize a contact were assumed eligible. The survey implementation manual recommends the use of median weights for cross-country comparisons.

⁹ The Enterprise Surveys ask establishments to report the number of permanent, full-time employees at the end of the fiscal year prior to the year of the survey and three fiscal years ago. So we do not have a measure of job creation and destruction in the year the establishment was born, that is, first started operations in the country.

Our data is subject to some caveats. First, our results on small firms are subject to the limitation that the Enterprise Surveys sample only the formal sector in each country and exclude the informal sector. Some of the developing countries in our sample have large informal sectors which implies that we are underestimating the importance of the SME sector in those countries. In addition, since the sampling frame is restricted to 5 employees or above, our results do not speak to the micro enterprises.

Second, our data is only on the continuing/surviving firms and hence we have no data on job destruction by firms which were liquidated over the sampling period. On a related note, the surveys are stratified only by industry, firm size, and geographical location and so we may not have a completely representative sample of firm ages, though the firms within the strata are randomly sampled. Hence we present all our results on firm age as being conditional on firm size.

Third, our analysis is at the establishment level and not at the firm level since the sampling unit in the Enterprise Surveys is the establishment.¹⁰ While this has the advantage that our job creation measures are well defined and capture actual new jobs at the establishment rather than changes from mergers, acquisitions, and divestitures, we are not able to measure firm size accurately for multi-establishment firms. However we are helped to some extent that the establishments in our sample report whether they are part of a larger firm or whether they are stand-alone. While most of the establishments in our data are stand-alone establishments (86%) and hence can be treated as firms, for robustness, we repeat the analysis on the sub-sample of firms that report that they have a single establishment and find that all our results about relative

¹⁰ In the Enterprise Surveys, the establishment is defined as a physical location where business is carried out and where industrial operations take place or services are provided. In addition, an establishment must make its own financial decisions, have its own financial statements separate from those of the firm, and have its own management and control over its payroll.

contributions to employment and growth hold. Henceforth, we will use the term establishment and firm interchangeably.

Finally, our data is based on survey data rather than individual country census. However, our enquiries with the survey implementation team reveal that mean response rates across our sample of countries is 70% which suggests that we have a representative sample of firms across economies. While we recognize fully the above data limitations, we believe that this initial cross-country analysis is useful in understanding the relationship between size, job creation and growth in developing countries. Given the various data caveats, the data presented in this paper is best used as cross-country evidence on the role of small firms in job creation.

III. Summary Statistics

In this section, we first preview the evidence on the relation between firm size and aggregate employment and job creation shares across countries. Where possible we contrast our findings to the U.S. evidence in earlier literature. We then present detailed tables and charts across the entire size distribution across country income groups. Like all survey data, our data is subject to the usual sampling errors for surveys and the data caveats discussed in section II. Hence, in presenting the summary statistics, we report medians across different sub-populations of firms.

A. Firm Size and Contribution to Employment

Table 1 shows the contribution to employment across the size classes in each country. Both the employment shares and the size classes are defined in the year before the survey. The sum of all the employment contributions across the size classes in an economy should add to 100%. The summary statistics show that the large firms (>99 employees) are the largest

contributors to total employment (54.6%). However, if we were to consider both small and medium firms (SMEs) together, we find the median employment share across our sample to be 45.45%, so comparable to large firms. Previous studies such as Ayyagari, Beck, and Demirguc-Kunt (2007) have also found SMEs to be significant contributors to aggregate employment although they define SMEs as firms with less than 250 employees and use data from a different database.¹¹

The median summary statistics across the 104 countries are also plotted in Figures 1 and 2. Figure 1 shows that it is the large firms (>99 employees) that are the largest contributors to total employment (54.6%). Small firms contribute 16.5% and Medium firms contribute 27%. We get similar patterns if we were to use mean values in each size bin rather than median shares across the 104 countries.

Table 1 also shows that we find similar results when we look across income groups¹² or geographic regions. Figure 2 plots the median statistics by income groups. Across income groups, establishments that employ more than 99 people have the largest employment shares, ranging from 44.2% in low income countries to 60.6% in upper-middle income countries. This is consistent with the US evidence in Haltiwanger, Jarmin, and Miranda (2010a) who find that large (and mature firms) in the US have the largest share of employment though they also find relatively little employment in large young firms. We do not focus on size-age breakdowns since our surveys are not stratified by firm age.

¹¹ The SME database in Ayyagari, Beck, and Demirguc-Kunt (2007) only covered the formal labor force in manufacturing. The sample of 54 countries in Ayyagari, Beck, and Demirguc-Kunt (2007) were mostly rich developed nations and thus differ greatly from the developing country sample in the Enterprise Surveys (ES). Of the 54 countries for which SME250 share of manufacturing labor force is reported in Ayyagari et al. (2007), only 30 countries overlapped with the ES database. When we include the 44 countries for which we have additional data from sources other than the ES, we find the SME250 Manufacturing measure in our data to be significantly correlated with that in Ayyagari et al. (2007).

¹² We only have 9 high-income countries in our sample – Croatia, Czech Republic, Estonia, Hungary, Latvia, Poland, Slovak Republic, Slovenia, and The Bahamas

Overall, we find that large firms have the largest shares of employment across developing countries.

B. Firm Size and Contribution to Job Creation

Next we analyze how job creation is affected by firm size. We examine the job creation in each size class as a share of total job creation in the economy, where job creation is defined as the employment change over a two year period.¹³ The size classifications are in the base year. Of the 104 countries in our sample, 18 countries had a net job loss and we do not have job creation data for Bangladesh. To allow for easier interpretation, we report the data in the tables for the two samples, that is the 85 countries which had a net positive job creation and 18 countries which had a net job loss, separately.

In Panel A of Table 2, we present the job creation shares by size class in the 85 countries that had a net positive job creation. Overall, small firms generate a significant share of overall jobs in the economy as indicated by the high sample mean of 57.8% and median of 45.34%. Figure 3 presents the contribution to net job creation over a two year period as a share of total job creation in the economy in that period, by firm size classes. The size classes are defined in the base year. Of the 104 countries in our original sample, 18 of the countries had a net job loss and for 1 country (Bangladesh) we do not have the employment levels in the base year so we are unable to calculate job creation numbers. Hence, Figure 3 plots the median values in each size bin across only 85 countries. Figure 3 also shows that net job creation is largest in the small firms. Figure 4 shows the split across income groups in the 85 countries that had a net positive

¹³ The job creation shares are computed only on continuing firms and exclude the year of firm birth, and so we are unable to draw conclusions about firm births or the start-ups in our data. However, as shown in Klapper and Love (2010), the rate of firm birth is much lower in developing economies.

job creation and we find that the job creation share for firms with less than 20 employees ranges from 39.84% in high income countries (median) to 58.34% in low income countries.

In Panel B of Table 2 we focus on the 18 countries that had a net job loss and report the job creation/destruction in each bin as a share of overall job loss in the country. Interestingly, we find that only in 2 of the 18 countries (Eritrea and Uzbekistan), the small firms have a net job loss. When we look at the summary statistics across the countries we find that the mean and median value for firms with >99 employees is negative suggesting that it is the large firms that are losing jobs in these economies. This is also seen in Figure 5 where firms with over 99 employees have the largest job loss. Figure 6 shows median statistics across income groups and here again we find that across income groups the firms with >99 employees are losing jobs where as even in these economies the smallest firms with less than 20 employees are creating jobs.¹⁴

Overall, we find that small firms have the largest shares of job creation but large firms have the largest share of job losses. Even in countries which had a net job loss we find the small firms to be creating jobs.

In the next section, we turn to a more systematic and rigorous analysis to validate our findings above.

¹⁴ The 18 countries experiencing job losses are Botswana, Burundi, Cote d'Ivoire, El Salvador, Eritrea, Honduras, Lao PDR, Latvia, Former Yugoslav Republic of Macedonia, Mexico, Nepal, Panama, Serbia, Sierra Leone, Tonga, Uzbekistan, Western Samoa, and Yemen Republic. Most of these countries have had civil strife and ethnic conflict and it is conceivable that when institutions break down, it is only the small firms that are able to employ people and create jobs.

IV. Regression Analysis

In this section, we turn to a more systematic analysis of the summary statistics using regression analysis. Our primary objective is to understand the relationship between growth, size, and age. Hence we run regressions of the form:

$$\begin{aligned} \text{Growth} = & a + b_1 \text{Size} + b_2 \text{Age} + b_3 \text{Industry Dummies} + b_4 \text{Year Dummies} + b_5 \text{Country} \\ & \text{Dummies} + e \quad (1) \end{aligned}$$

Our main measure of growth is Employment Growth defined as the log difference between employment three years back and employment last year divided by two. We also use Sales Growth and Labor Productivity (Sales/Worker) Growth, constructed similarly, to see if there is an association between size and increase in sales and productivity. We use three dummies for size – 5-19 employees (reference category), 20-99 employees and 100+ employees that are consistent with the size stratification in the surveys. The size dummies are constructed in the base year. In addition to country and year fixed effects, we control for industry fixed effects since firm size distributions vary by industry as do net growth rate patterns. We also control for firm age since Haltiwanger et al. (2010b) find that there is no systematic relation between firm size and growth once age is controlled for although their evidence is based only on US data. Firm age in our data is defined as the number of years since the establishment began operations in the country.¹⁵

While there are several approaches to the use of survey data in regression analysis, we follow the “model approach” (see Cameron and Trivedi, 2005) used in the literature which utilizes data collected in the sample directly, without weighing. Hence we use simple OLS

¹⁵ The year when the establishment began operations refers to the year in which the establishment actually started producing or providing services. If the establishment was privatized, then the date refers to when the original government-owned establishment began operations.

regressions to estimate (1), with standard errors clustered at the country level. As robustness, we also report weighted estimates below.

Cols.1-3 of Panel A in Table 3 present employment growth regressions, cols. 4-6 present sales growth regressions and cols. 7-9 present productivity growth regressions. Col.1 shows that small firms have higher employment growth than medium and large firms controlling for firm age. These relations also hold when we look at manufacturing firms in col. 2 and non-manufacturing firms in col. 3.¹⁶ Our results on size are in contrast to Haltiwanger, Jarmin, and Miranda (2010b) who find that once they control for firm age there is no systematic relationship between firm size and growth. Clearly in developing economies small firms have higher employment growth, even after controlling for age.

The sales growth regressions in cols. 5-7 show that small firms have higher sales growth than larger firms controlling for firm age and these results hold for both the sub-samples of manufacturing and non-manufacturing firms. When we examine productivity growth regressions we find that small firms have significantly lower productivity growth than large firms controlling for firm age.

In unreported results, we obtain similar findings when we examine just the Food industry across all the countries in our sample. Manufacture of food products and beverages (ISIC 15) is one of the manufacturing industries found in 100 countries in our sample. Here again the smallest firms (<20 employees) have higher employment growth, higher sales growth, and lower productivity growth than firms with more than 99 employees.

In the sub-sections below we put our results through a battery of robustness tests.

¹⁶ In 3 countries, Bahamas, Grenada, and Guyana, the only industries covered were Textiles and Other Manufacturing.

A. Across Income Groups

In this section we examine how our results vary across country income groups. In Table 4, in cols. 1-4 we look at employment growth, in cols. 5-8 we look at sales growth and in cols. 9-12 we look at productivity growth.

We find that across all income groups, controlling for size and age in all regressions, small firms have higher employment growth than large firms. Small firms have significantly higher sales growth compared to large firms in middle-income countries but no significant difference in the low and high income countries. We also find that small firms have significantly lower productivity growth than large firms across all income groups.

B. Size of Informal Sector

In this section we examine whether the contribution of size and age to growth varies depending on the size of the informal sector in the economy. Of the 103 countries for which we have data on firm growth rates, we have data on the informal sector's contribution to GDP in 92 countries from Schneider et al. (2010). In Table 5, in cols. 1-3 we report results for countries with a large informal sector (above the median value) and in cols. 4-6 we report results for countries with a small informal sector (below the median value).

Table 5 shows that when we look at countries with large informal sector we find that the smallest firms have higher employment growth, higher sales growth but lower productivity growth than firms with more than 99 employees. We find similar results in the sample with small informal sectors in cols. 4-6. This suggests that the size of the informal sector does not make a material difference to our results.

C. Stand-Alone Establishments vs. Establishments that are part of a larger firm

Since all our data is at the establishment level, in this section, we split our sample into establishments that state that they belong to a bigger firm and those that are stand alone.

Cols. 1-3 of Table 6 report results for a sample of single establishment firms. We find that the small firms have higher employment growth, higher sales growth and lower productivity growth than firms with over 99 employees. In the sample of establishments that are part of a larger firm in cols. 4-6, we again find that small establishments have higher employment growth than large establishments. While small establishments have significantly higher sales growth than large firms, they are not significantly different from medium size (20-99 employees) establishments. Small establishments do have significantly lower productivity growth than the medium and large establishments. Overall, across both sub-samples, we find consistent results that small establishments have higher employment growth, higher sales growth and lower productivity growth than large establishments.

D. Additional Robustness

In this section we perform additional robustness tests of our main results. In cols. 1- 3 of Table 7 we include country x sector interaction effects and find all our results to hold. We do not include the interaction effects in all tables so as to not to overwhelm the sample with so many interaction effects. Cols. 1-3 show that small firms with less than 20 employees have higher employment growth, higher sales growth, and lower productivity growth than medium (20-99 employees) and large firms(>99 employees).

In 99 surveys in our sample, for each firm, we have a unique stratification identifier.¹⁷ Hence in cols. 4-6 we restrict the sample to these 99 countries and run OLS regressions clustering standard errors by survey strata. None of our results are changed. Small firms have higher employment and sales growth but lower productivity growth.

Finally, in cols. 7-9 we use survey regression techniques that adopt a “census approach”¹⁸ where in, the firms are weighed by their sampling weights. This approach gives more weight to firms in the larger countries, and thus provides a better description of the outcomes to typical firms across the world. The standard errors take weights, clustering and stratification into account. The weighted survey regressions show that the smallest firms with <20 employees have significantly higher employment growth than firms with more than 99 employees. When we look at sales growth, we find that small firms have as good or higher sales growth than large firms – the medium and large firm dummies are negative but not significant. When we look at productivity growth, we do not find any significant differences based on firm size. Overall, we find that using weighted survey regressions does not make a material difference to our results.

E. Role of Firm Age

In this section, we examine the role of firm age, conditional on size, on total employment and job creation rates across countries. We define three dummy variables – Young Firms (≤ 5 years), Mid-Age firms (6-10 years) and Mature Firms (11+ years). Figure 7 reports the employment shares across the 104 countries in our sample by firm age and firm size classes.

¹⁷ For the remaining surveys (Afghanistan, Ghana, Kenya and Nigeria), we do not have a stratification identifier because block enumeration was used to overcome the lack of a reliable sample frame

¹⁸ For a discussion of the census and model based approaches see Cameron and Trivedi (2005). For a practical illustration of the differences in the two approaches see Frohlich, Carriere, Potvin, and Black (2001).

Both the employment shares and the size and age classes are defined in the year before the survey. We first compute the employment shares in each country in each size-age bin and then plot the median values. Figure 7 shows that it is the large mature firms (100+ employees and 11+ years) that are the largest contributors to total employment (34.84%). Furthermore, in each size bin, the oldest firms (11+ years), have the largest employment shares. We get similar patterns if we were to use mean values in each size-age bin rather than median shares across the 104 countries.

Figures 8 and 9 present statistics on job creation and loss in our sample of surviving firms. Figure 8 presents the contribution to net job creation over a two year period as a share of total job creation in the economy in that period, by firm age and size classes. The age and size classes are defined in the base year. Of the 104 countries in our original sample, 18 of the countries had a net job loss and for 1 country (Bangladesh) we do not have the employment levels in the base year so we are unable to calculate job creation numbers. Hence, Figure 8 plots the median values in each size-age bin across 85 countries. Figure 8 shows that net job creation is largest in the small young firms (<20 employees and ≤ 5 years). In Figure 9, we focus on the 18 countries that had a net job loss and find that the large firms and mature firms, that is, firms with 100+ employees and 11+ years old, have the largest job loss. Here again small young firms have are the biggest job creators in these economies.

In Table 8 we examine re-estimate the growth regressions replacing the age variable with the two age dummies. Our results are consistent with what we found in Table 3 – older firms have lower employment growth and sales growth. Using the dummies we find that the youngest firms i.e. ≤ 5 years are the fastest growing in terms of employment growth and sales growth. While age was insignificant in the productivity growth regressions in Table 3, here we find that

the Mid-Age dummy (6-10 years) is negative and significant suggesting that young firms ≤ 5 years have higher productivity growth than mid-age firms (6-10 years) and as high or higher productivity growth than the mature firms (11+ years).

F. Discussion

In this section, we discuss our findings in the context of the existing literature on firm size, and growth. The empirical literature on firm size and growth has largely focused on understanding the role of firm size and age for growth dynamics, and why Gibrats Law, the proposition that firm growth is independent of size, does not hold.¹⁹ In the most recent evidence on this subject, Haltiwanger, Jarmin, and Miranda (2010a, 2010b) study U.S. census data and find that over the period 1992-2005, the large and mature firms (over 500 employees and 10+ years) account for about 45% of employment and most job creation (and destruction). They find that while size is inversely related to growth without controlling for age in the US, there is no systematic relation between size and growth once age is controlled for.

Our results, on the other hand, suggest that in developing economies small firms are significant contributors to employment and job creation. We do not have data on job destruction. In employment growth regressions, we find that size remains a significant predictor for employment growth even after controlling for age. The importance of small firms in developing economies is of significance since we know that in these countries, small firms face many institutional constraints such as limited access to finance (e.g. Demircuc-Kunt and Maksimovic, 1998; Rajan and Zingales, 1998; Beck, Demircuc-Kunt, and Maksimovic, 2005), poorly

¹⁹ See Sutton, 1997 for a review. Early studies such as Birch (1979, 1981, and 1987) found an inverse relation between growth and size and found small firms to be particularly important in job creation. Evans (1987), Dunne, Roberts, and Samuelson (1989), and Dunnes and Hughes (1994) focus on unraveling the roles played by firm age and size as determinants and find that larger firms have lower growth rates but are more likely to survive.

functioning judicial systems and legal enforcement (e.g. La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1997), and weak property rights protection (e.g. Claessens and Laeven, 2003).²⁰ Our findings on SMEs are broadly consistent with the OECD evidence in Haltiwanger, Scarpetta, and Schweiger's (2010) where they study net employment and find that small firms account for a higher pace of job creation and destruction. Our findings are also consistent with the results in Beck, Demirguc-Kunt, and Levine (2005) who find a large SME contribution to employment across 54 (mostly developed) countries and a strong association between the SME sector and GDP/capita growth but no evidence of causality.

On age, we also find that the conditional on size, youngest firms (five years old or less) have higher employment growth, sales growth, and productivity growth. Our results pertain to continuing firms, so it is important to bear in mind that the youngest firm class is most subject to survivorship bias in our data. In addition, our surveys are not stratified by age and we do not have growth rates in the year of the birth. So we are cautious in not emphasizing our results on firm age.

We also find that while small firms are important for employment and job creation, the large firms have the highest productivity growth in our sample. This is consistent with the evidence in other work such as Banejee and Duflo (2005), Maksimovic and Phillips (2002), and Bartelsman, Haltiwanger, and Scarpetta (2009) who find that larger firms are more productive. Other studies such as Beck, Demirguc-Kunt, and Maksimovic (2006) also suggest that there is a positive relationship between firm size and the development of financial and legal institutions in a country.

²⁰ Note however that Rauch (2010) shows that in less developed countries institutional reforms that disproportionately benefit small businesses may have adverse consequences such as interfering with the impact of trade reform since SMEs tend not to be export oriented and produce low quality output.

V. Conclusion

We present a unique cross-country database on the contribution of SMEs to total employment, job creation, and growth across 104 developing economies. We find that while small firms (<20 employees) have the smallest contribution to aggregate employment compared to medium (20-99 employees) and large firms (100+ employees), SMEs (<99 employees) are comparable to large firms in their contribution to aggregate employment. We also find that small firms are important contributors to total job creation. The relationship between size and job creation exists even when we control for firm age. However small firms also have lower productivity growth than large firms, which explains why job creation does not translate into faster growth.

With countries all around the world struggling to recover from the crisis, job creation policies are at the top of the agenda for policymakers. Our results caution that the challenge for policymakers is not only to create more jobs, but also to create better quality jobs to promote growth. Overall, our results show that while small firms create more jobs than large firms, their contribution to productivity growth is not as high as that of large firms. Growth and increases in productivity require a policy focus on the potential obstacles, which range from lack of access to finance, the need for business training and literacy programs, as well as addressing other constraints such as taxes, regulations and corruption, which are the focus of an active research agenda. In addition, policies to improve entrepreneurship and innovation are likely to be important, since lack of dynamism is a distinguishing feature of developing countries and young firms tend to be productive and among the fastest growing. Finally, our results also suggest a

need for greater focus on large firms which have a notable share of employment and also have higher productivity growth compared to small firms.

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Figure 1: Employment Shares across countries

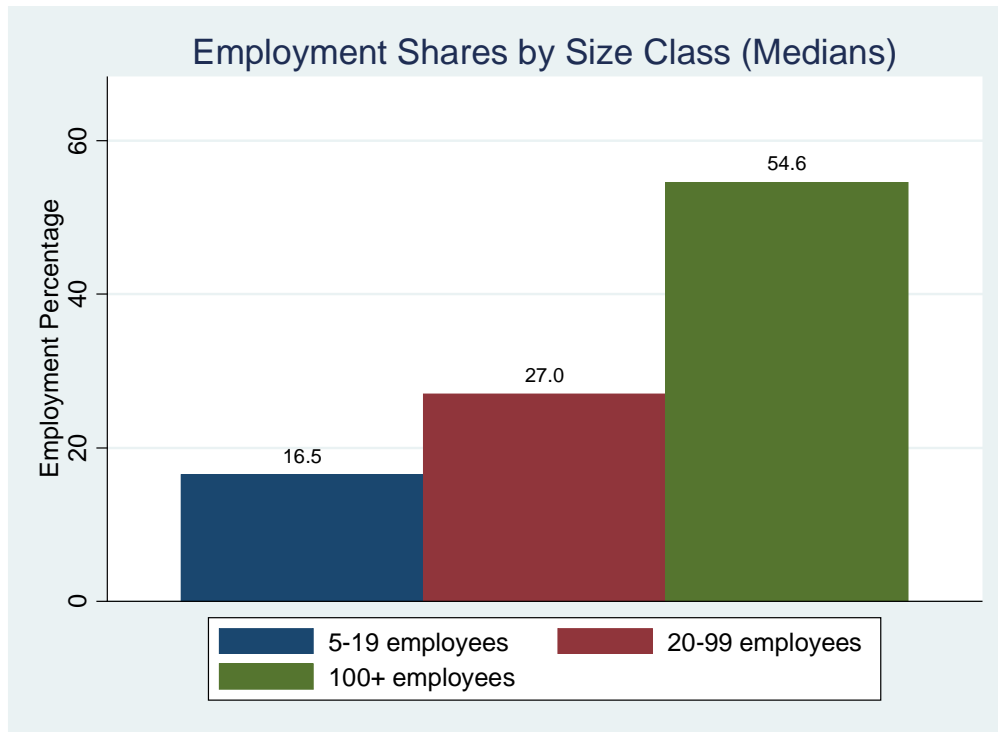


Figure 2: Employment Shares across Country Income Groups

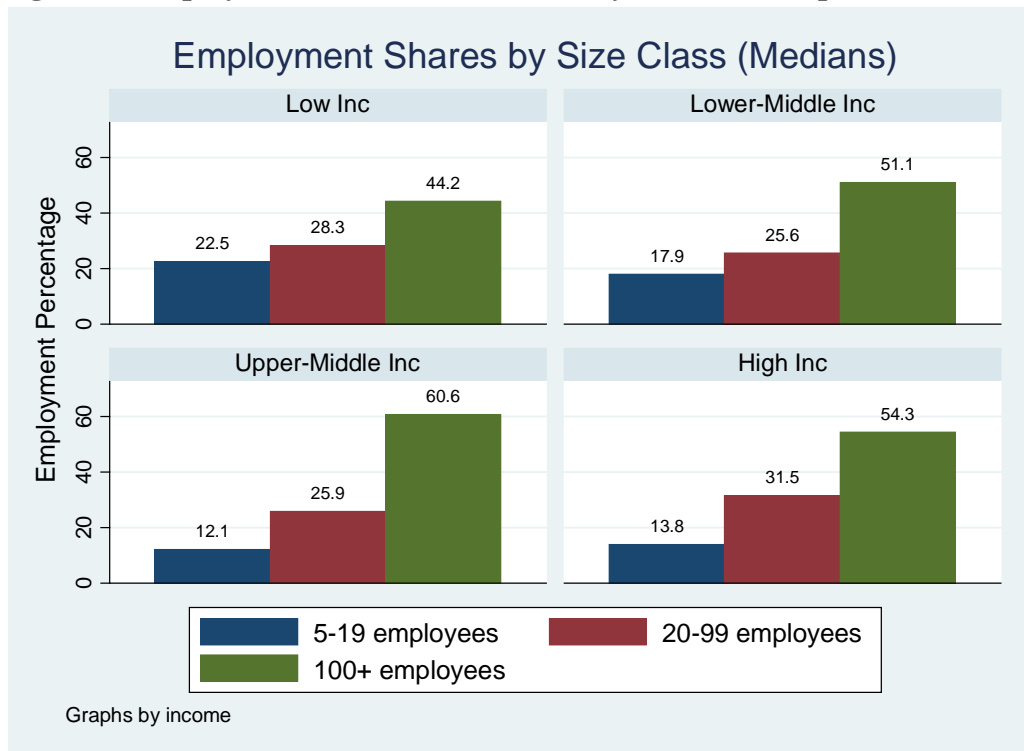


Figure 3: Job Creation Shares across countries
In Countries with net job creation (85 countries)

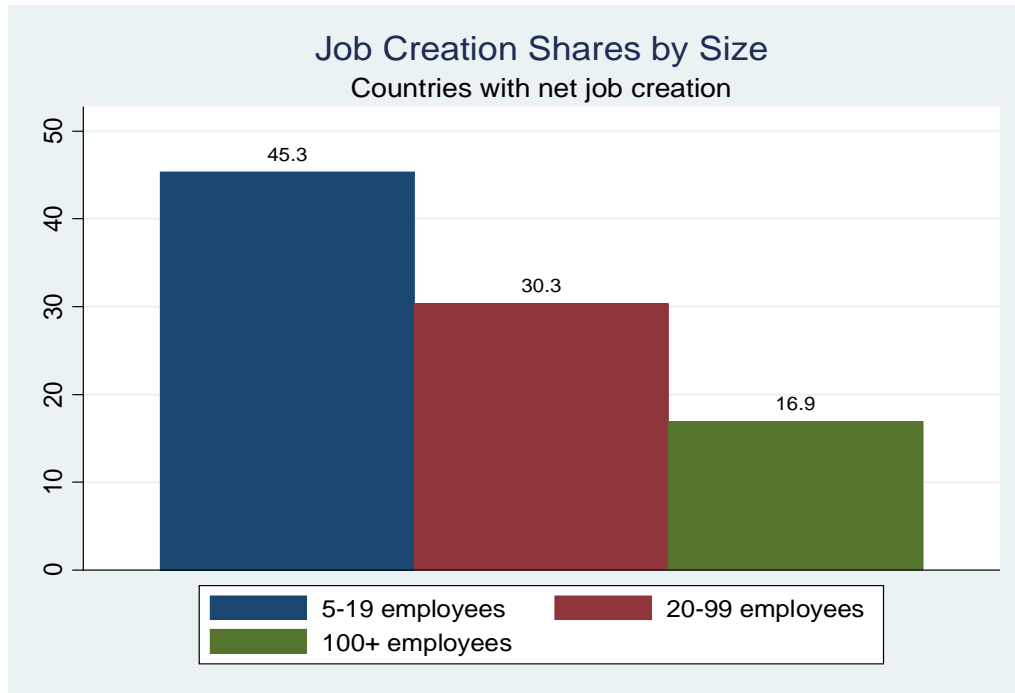


Figure 4: Job Creation Shares across Country Income Groups
In Countries with net job creation (85 countries)

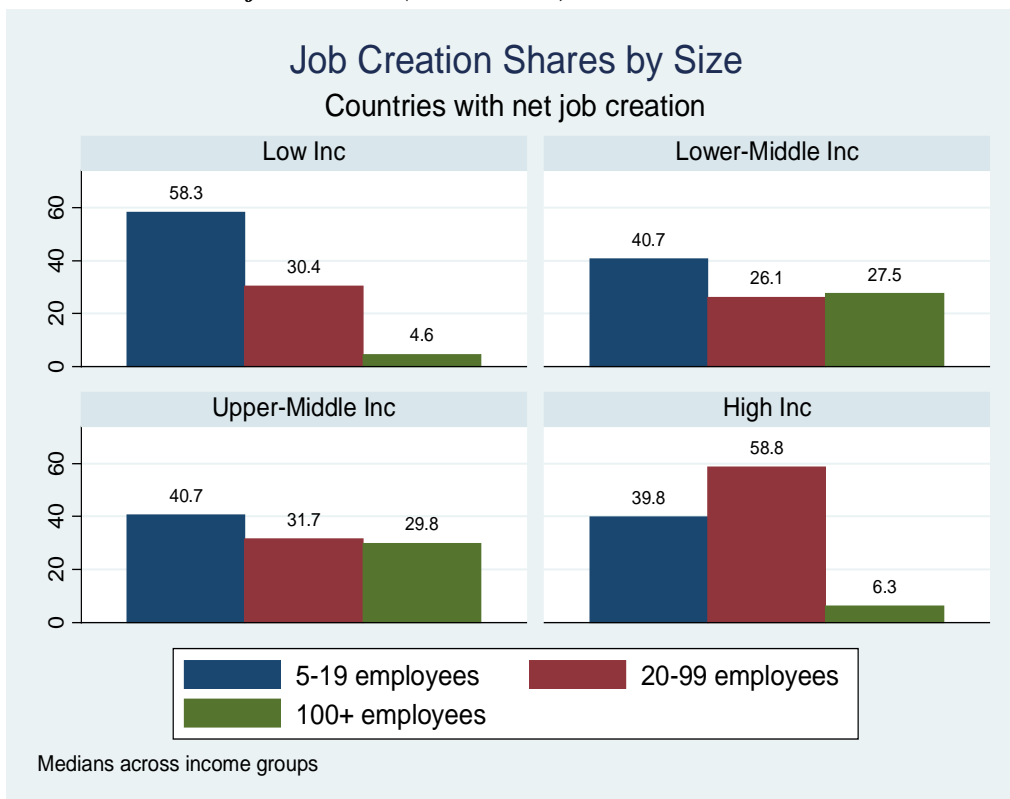


Figure 5: Job Creation Shares across Country Income Groups
In Countries with net job loss (18 countries)

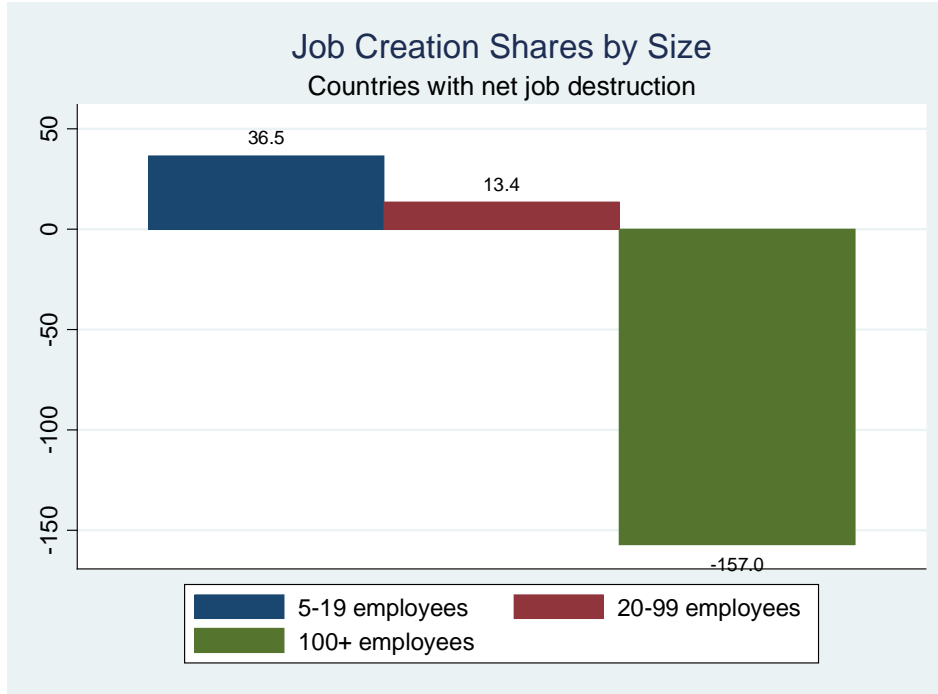


Figure 6: Job Creation Shares across Country Income Groups
In Countries with net job loss (18 countries)

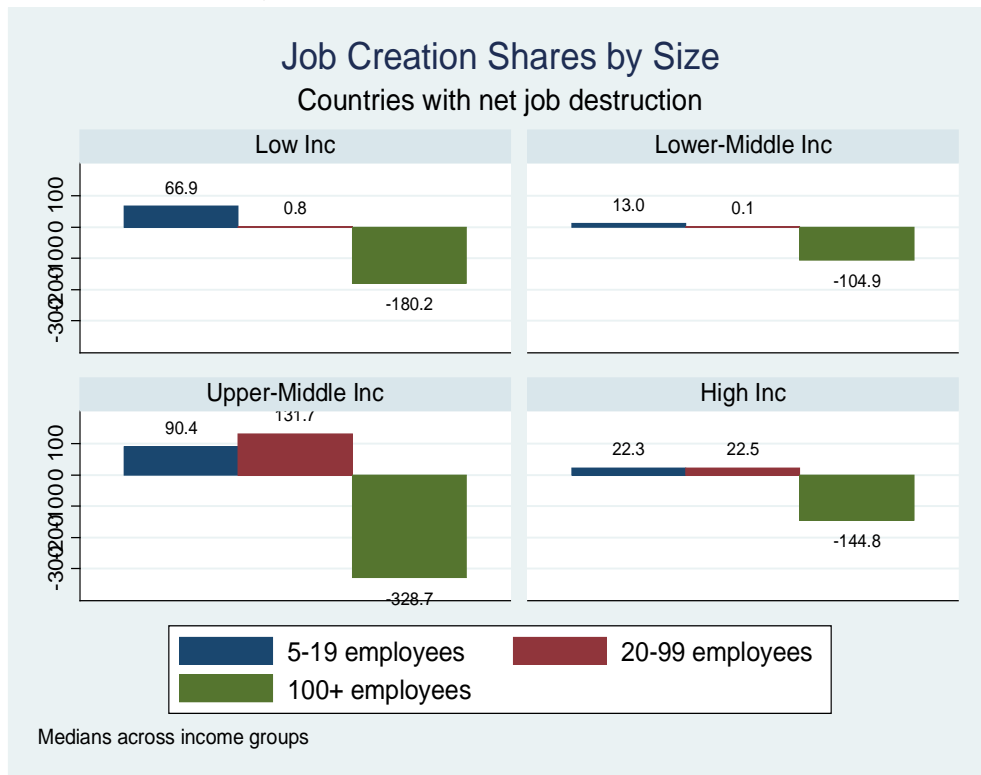


Figure 7: Employment Shares across countries by Size and Age

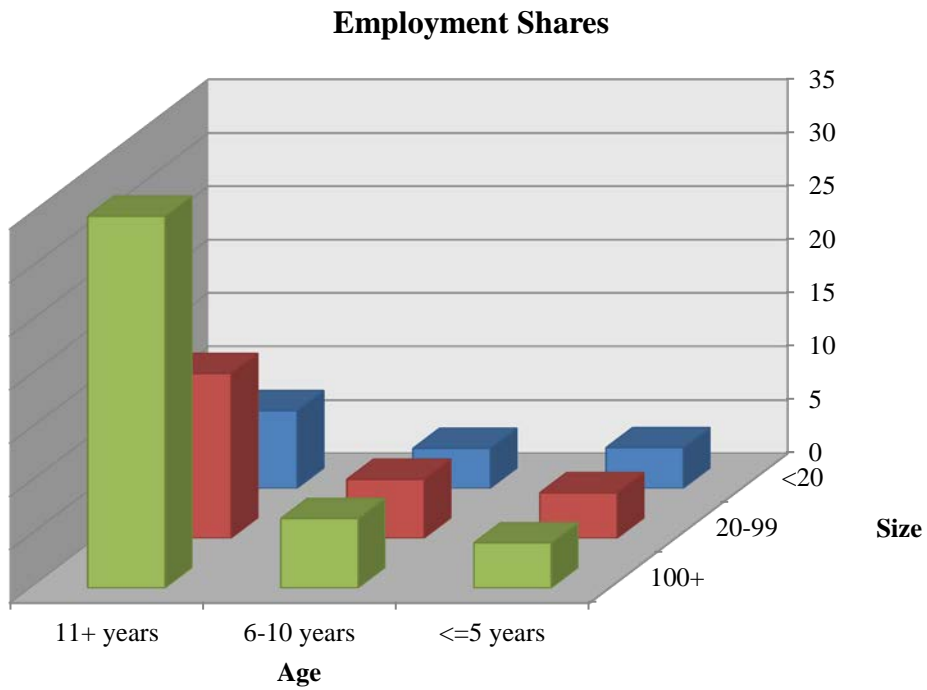


Figure 8: Job Creation Shares across countries by Size and Age
In Countries with net job gain (85 countries)

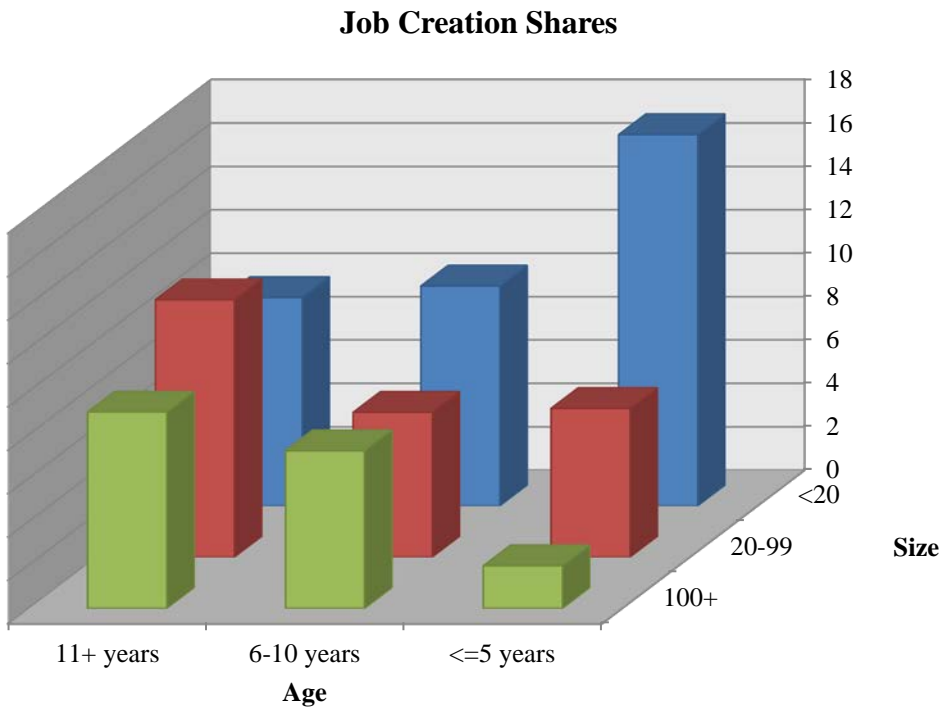


Figure 9: Job Creation Shares across countries by Size and Age
In Countries with net job loss (18 countries)

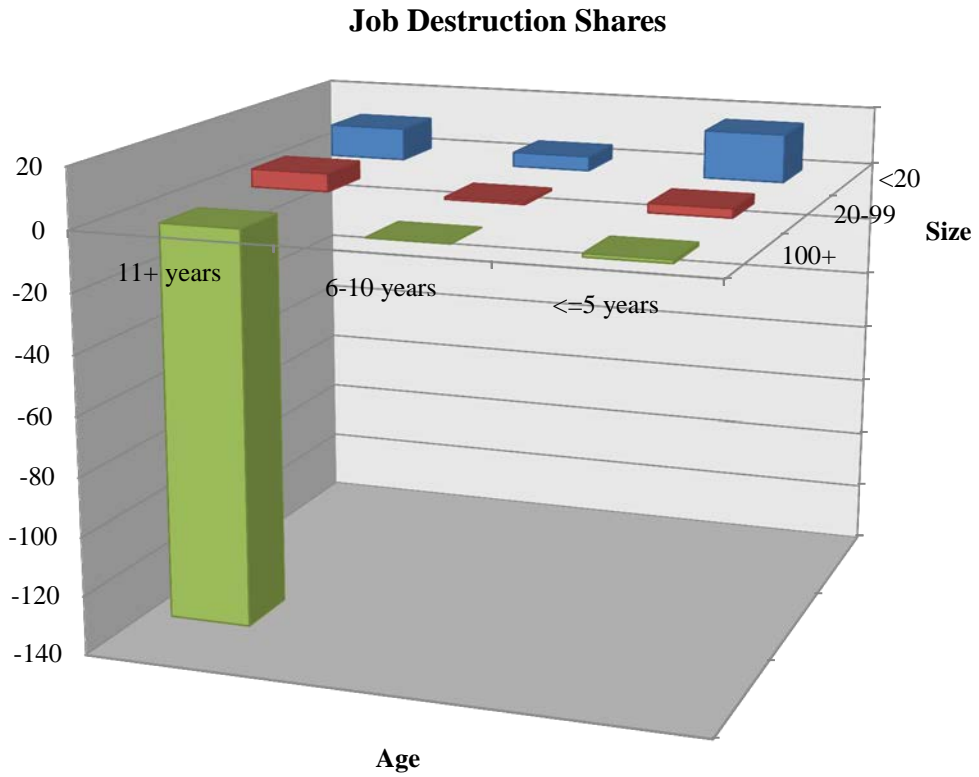


Table 1: Contribution to Employment Shares by Size Class

This table presents the contribution of different size classes to total employment in each country. Total employment is the population estimate of the number of permanent, full-time employees in a particular year in each country, derived from the World Bank Enterprise Surveys. In cols. 1-3, we report employment shares across 3 size classes based on permanent full time employment: 5-19 employees, 20-99 employees, and 100+ employees. We report summary statistics and median values across income groups and regions at the foot of the table.

Nation	Survey Year	Size Class		
		1 5-19	2 20-99	3 100+
Afghanistan	2008	22.40	33.05	44.54
Albania	2007	24.62	38.77	36.62
Angola	2006	59.66	28.78	11.56
Argentina	2006	4.25	13.86	81.89
Armenia	2009	10.86	25.35	63.79
Azerbaijan	2009	9.54	20.29	70.17
Bangladesh	2007	3.23	6.25	90.52
Belarus	2008	4.83	14.05	81.12
Benin	2009	28.79	30.31	40.90
Bhutan	2009	24.97	27.65	47.38
Bolivia	2006	18.66	40.62	40.71
Bosnia and Herzegovina	2009	10.67	32.00	57.33
Botswana	2006	17.98	26.59	55.43
Brazil	2009	2.66	17.53	79.81
Bulgaria	2007	12.92	30.04	57.03
Burkina Faso	2009	20.39	23.72	55.89
Burundi	2006	49.70	37.04	13.27
Cameroon	2009	10.39	18.18	71.44
Cape Verde	2009	28.01	37.64	34.34
Chad	2009	20.14	40.94	38.92
Chile	2010	2.25	11.30	86.45
Colombia	2006	20.31	40.37	39.32
Congo, Dem. Rep.	2010	15.10	14.71	70.19
Congo, Rep.	2009	13.73	39.48	46.79
Costa Rica	2010	8.78	21.53	69.68
Cote d'Ivoire	2009	28.94	18.97	52.10
Croatia	2007	11.24	40.04	48.71
Czech Republic	2009	13.83	31.83	54.34
Ecuador	2006	13.05	25.88	61.07
El Salvador	2006	15.66	20.87	63.47
Eritrea	2009	40.13	47.38	12.49
Estonia	2009	21.50	37.96	40.54
Fiji	2009	13.29	27.32	59.39
Gabon	2009	13.87	22.10	64.03
Gambia	2006	23.70	45.98	30.32
Georgia	2008	6.46	15.45	78.09
Ghana	2007	16.42	19.53	64.05
Grenada	2010	24.09	36.77	39.14
Guatemala	2010	5.05	13.97	80.98
Guinea	2006	41.50	20.97	37.53
Guinea-Bissau	2006	45.32	30.07	24.61
Guyana	2010	5.58	21.96	72.46
Honduras	2006	5.56	14.36	80.07
Hungary	2009	8.35	23.87	67.78
Indonesia	2009	26.03	14.70	59.26
Jamaica	2010	25.05	36.24	38.71
Kazakhstan	2009	8.18	25.91	65.91
Kenya	2007	11.11	21.51	67.38
Kosovo	2009	36.49	31.29	32.22
Kyrgyz Republic	2009	12.29	28.83	58.88
Lao PDR	2009	26.69	29.47	43.85
Latvia	2009	16.53	31.53	51.94
Lesotho	2009	4.49	8.38	87.13
Liberia	2009	62.85	24.60	12.55
Lithuania	2009	17.20	38.82	43.98
Macedonia, FYR	2009	16.10	35.32	48.59
Madagascar	2009	10.27	23.82	65.91

Nation	Survey Year	Size Class		
		1 5-19	2 20-99	3 100+
Malawi	2009	7.39	16.39	76.23
Mali	2007	37.13	40.31	22.56
Mauritania	2006	42.67	35.64	21.69
Mauritius	2009	10.00	24.19	65.80
Mexico	2010	4.79	8.01	87.20
Micronesia, Fed. Sts.	2009	31.94	68.06	0.00
Moldova	2009	17.11	32.87	50.02
Mongolia	2009	13.71	43.58	42.71
Montenegro	2009	37.30	33.31	29.39
Mozambique	2007	14.16	30.82	55.02
Namibia	2006	37.59	39.57	22.85
Nepal	2009	49.16	24.49	26.35
Nicaragua	2006	19.30	33.41	47.30
Niger	2009	42.64	40.07	17.29
Nigeria	2007	36.37	40.97	22.66
Panama	2006	12.06	23.82	64.11
Paraguay	2006	14.43	36.51	49.07
Peru	2010	7.25	15.06	77.69
Philippines	2009	8.58	21.56	69.86
Poland	2009	15.08	21.82	63.09
Romania	2009	19.68	27.85	52.47
Russian Federation	2009	1.74	7.56	90.70
Rwanda	2006	16.97	26.65	56.38
Senegal	2007	24.97	18.33	56.70
Serbia	2009	9.83	24.14	66.04
Sierra Leone	2009	41.35	25.32	33.32
Slovak Republic	2009	19.84	33.37	46.79
Slovenia	2009	10.97	22.51	66.52
South Africa	2007	7.97	31.38	60.65
Swaziland	2006	15.58	18.44	65.98
Tajikistan	2008	7.29	22.10	70.62
Tanzania	2006	22.63	32.32	45.04
The Bahamas	2010	13.12	29.77	57.12
Timor-Leste	2009	22.14	45.28	32.58
Togo	2009	44.90	18.64	36.46
Tonga	2009	83.51	16.49	0.00
Turkey	2008	7.50	14.53	77.98
Uganda	2006	19.51	30.65	49.84
Ukraine	2008	9.28	21.32	69.40
Uruguay	2006	22.63	34.18	43.19
Uzbekistan	2008	27.58	29.70	42.72
Vanuatu	2009	28.99	71.01	0.00
Venezuela, RB	2006	29.64	25.29	45.07
Vietnam	2009	5.13	16.62	78.25
Western Samoa	2009	19.26	31.96	48.78
Yemen, Rep.	2010	30.39	14.85	54.76
Zambia	2007	9.28	27.81	62.91
Summary Statistics				
Minimum		1.74	6.25	0.00
Mean		20.21	27.73	52.06
Median		16.48	26.99	54.55
Maximum		83.51	71.01	90.70
Median across Income Groups				
Low Inc		22.52	28.32	44.20
Lower-Middle Inc		17.89	25.61	51.06
Upper-Middle Inc		12.06	25.91	60.65
High Inc		13.83	31.53	54.34
Median across Regions				
AFR		21.51	27.23	48.31
EAP		24.09	28.39	46.31
ECA		12.61	29.27	57.18
LAC		13.05	23.82	63.47
MNA		30.39	14.85	54.76
SAR		23.69	26.07	45.96

Table 2: Job Creation as a share of total job creation by Size Class

This table presents the contribution to job creation by different size classes. Job Creation is the population estimate of the change in the number of permanent, full-time employees over a two year period, derived from the World Bank Enterprise Surveys. In cols. 1-3, we report 3 size classes based on permanent full time employment in the base year : 5-19 employees, 20-99 employees, and 100+ employees. In Panel A we report data for 81 countries that had a net positive job creation (across all sizes) over the two periods. In Panel B we report data for 17 countries that had a net job loss (across all sizes) over the two periods. We report summary statistics and median values across income groups and regions at the foot of each panel.

Panel A: Countries with net job creation

Nation	Survey Year	Size Class		
		1 5-19	2 20-99	3 100+
Afghanistan	2008	147.19	82.03	-129.22
Albania	2007	51.43	33.05	15.52
Angola	2006	77.43	29.66	-7.09
Argentina	2006	13.48	19.00	67.52
Armenia	2009	22.11	17.10	60.79
Azerbaijan	2009	15.61	20.43	63.96
Belarus	2008	9.10	44.20	46.70
Benin	2009	101.96	25.19	-27.15
Bhutan	2009	61.00	11.51	27.48
Bolivia	2006	63.18	37.76	-0.94
Bosnia and Herzegovina	2009	38.29	44.86	16.85
Brazil	2009	4.65	14.67	80.68
Bulgaria	2007	31.32	38.23	30.45
Burkina Faso	2009	118.42	176.02	-194.44
Cameroon	2009	13.66	23.98	62.37
Cape Verde	2009	40.70	45.05	14.25
Chad	2009	56.38	47.40	-3.79
Chile	2010	6.83	6.96	86.21
Colombia	2006	56.46	15.15	28.39
Congo, Dem. Rep.	2010	103.94	1.88	-5.81
Congo, Rep.	2009	22.43	37.81	39.76
Costa Rica	2010	33.95	30.31	35.74
Croatia	2007	11.78	86.87	1.35
Czech Republic	2009	45.34	29.27	25.39
Ecuador	2006	22.34	35.00	42.65
Estonia	2009	22.64	39.39	37.97
Fiji	2009	24.37	6.75	68.89
Gabon	2009	103.26	104.65	-107.92
Gambia	2006	60.30	55.49	-15.79
Georgia	2008	8.97	9.86	81.18
Ghana	2007	40.82	4.06	55.12
Grenada	2010	121.24	78.20	-99.44
Guatemala	2010	53.77	29.30	16.93
Guinea	2006	43.52	22.50	33.98
Guinea-Bissau	2006	104.32	3.47	-7.78
Guyana	2010	13.00	34.50	52.50
Hungary	2009	50.30	65.71	-16.01
Indonesia	2009	72.45	-16.26	43.80
Jamaica	2010	28.87	33.30	37.83
Kazakhstan	2009	20.38	22.33	57.30
Kenya	2007	24.37	35.16	40.47
Kosovo	2009	40.26	9.31	50.44
Kyrgyz Republic	2009	464.40	371.80	-736.20
Lesotho	2009	28.26	-4.49	76.24
Liberia	2009	220.94	-79.95	-40.99
Lithuania	2009	30.30	47.93	21.76
Madagascar	2009	45.43	28.32	26.25

		Size Class		
		1	2	3
Nation	Survey Year	5-19	20-99	100+
Malawi	2009	13.54	32.39	54.07
Mali	2007	73.99	18.14	7.87
Mauritania	2006	128.13	42.41	-70.54
Mauritius	2009	64.02	6.93	29.05
Micronesia, Fed. Sts.	2009	77.15	22.85	0.00
Moldova	2009	36.48	20.94	42.58
Mongolia	2009	43.56	26.10	30.35
Montenegro	2009	56.49	34.92	8.59
Mozambique	2007	15.65	24.89	59.46
Namibia	2006	43.09	16.59	40.32
Nicaragua	2006	36.20	14.54	49.26
Niger	2009	102.15	21.51	-23.65
Nigeria	2007	58.57	37.88	3.55
Paraguay	2006	70.34	21.93	7.73
Peru	2010	117.67	45.91	-63.57
Philippines	2009	8.28	86.86	4.86
Poland	2009	49.13	81.36	-30.49
Romania	2009	95.77	49.71	-45.48
Russian Federation	2009	65.90	67.57	-33.47
Rwanda	2006	47.08	19.94	32.98
Senegal	2007	77.03	49.91	-26.93
Slovak Republic	2009	34.35	52.37	13.28
Slovenia	2009	23.53	65.21	11.26
South Africa	2007	30.37	48.13	21.50
Swaziland	2006	16.46	16.78	66.76
Tajikistan	2008	21.38	38.31	40.31
Tanzania	2006	44.32	35.92	19.76
The Bahamas	2010	68.86	32.97	-1.84
Timor-Leste	2009	89.17	10.83	0.00
Togo	2009	80.00	18.73	1.27
Turkey	2008	47.57	8.68	43.74
Uganda	2006	40.14	45.98	13.89
Ukraine	2008	99.13	27.28	-26.41
Uruguay	2006	54.47	30.15	15.38
Vanuatu	2009	71.41	45.36	-16.77
Venezuela, RB	2006	45.79	18.52	35.69
Vietnam	2009	34.99	63.50	1.50
Zambia	2007	39.56	51.43	9.01
Summary Statistics				
Minimum		4.65	-79.95	-736.20
Mean		57.80	37.74	4.46
Median		45.34	30.31	16.93
Maximum		464.40	371.80	86.21
Median across Income Groups				
Low Inc		58.34	30.36	4.57
Lower-Middle Inc		40.70	26.10	27.48
Upper-Middle Inc		40.69	31.68	29.75
High Inc		39.84	58.79	6.31
Median across Regions				
AFR		47.08	28.32	13.89
EAP		71.41	22.85	1.50
ECA		37.38	38.27	23.58
LAC		45.79	30.15	35.69
SAR		104.10	46.77	-50.87

Panel B: Countries with net job loss

		Size Class		
		1	2	3
Nation	Survey Year	5-19	20-99	100+
Botswana	2006	1560.04	913.80	-2573.84
Burundi	2006	66.90	13.30	-180.20
Cote d'Ivoire	2009	0.37	0.13	-100.50
El Salvador	2006	465.15	435.12	-1000.26
Eritrea	2009	-25.39	-28.24	-46.36
Honduras	2006	18.76	8.86	-127.61
Lao PDR	2009	2.45	0.81	-103.25
Latvia	2009	22.30	22.48	-144.77
Macedonia, FYR	2009	278.58	131.74	-510.31
Mexico	2010	36.92	13.60	-150.51
Nepal	2009	826.97	-45.40	-881.56
Panama	2006	90.43	138.26	-328.70
Serbia	2009	36.16	27.40	-163.56
Sierra Leone	2009	70.19	24.35	-194.54
Tonga	2009	0.31	-0.34	-99.97
Uzbekistan	2008	-0.41	-44.95	-54.64
Western Samoa	2009	12.96	-8.08	-104.88
Yemen, Rep.	2010	68.54	81.91	-250.45
Summary Statistics				
Minimum		-25.39	-45.40	-2573.84
Mean		196.18	93.60	-389.77
Median		36.54	13.45	-157.04
Maximum		1560.04	913.80	-46.36
Median across Income Groups				
Low Inc		66.90	0.81	-180.20
Lower-Middle Inc		12.96	0.13	-104.88
Upper-Middle Inc		90.43	131.74	-328.70
High Inc		22.30	22.48	-144.77
Median across Regions				
AFR		66.90	13.30	-180.20
EAP		2.45	-0.34	-103.25
ECA		29.23	24.94	-154.17
LAC		63.67	75.93	-239.60
MNA		68.54	81.91	-250.45
SAR		826.97	-45.40	-881.56

Table 3: Establishment Size and Growth

The regressions estimated in this table are: Employment Growth/Sales Growth/Productivity Growth = $a + b_0$ Size Dummy for 20-99 employees + b_1 Size Dummy for ≥ 100 employees + b_2 Age + Country Dummies + Sector Dummies + Year Dummies + e . Employment Growth is defined as the log difference in permanent, full-time employment over a two year period. Sales Growth is defined as the log difference in sales over a two year period and Labor Productivity Growth is defined as the log difference in labor productivity (Sales/Employment) over a two year period. In cols. 1, 4, and 7 we report results for the full sample. In cols. 2, 5, and 8 we report results for just the manufacturing sector and in cols. 3, 6, and 9 we report results for non-manufacturing firms. All data is at the firm level from the World Bank Enterprise Surveys. All regressions are OLS regressions with standard errors clustered at the country level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Employment Growth			Sales Growth			Productivity Growth		
	Full	Manufacturing	Non-Manufacturing	Full	Manufacturing	Non-Manufacturing	Full	Manufacturing	Non-Manufacturing
Medium Firm Dummy (20-99 employees)	-0.081*** (0.005)	-0.087*** (0.006)	-0.072*** (0.006)	-0.027*** (0.008)	-0.032*** (0.010)	-0.018 (0.012)	0.054*** (0.007)	0.053*** (0.009)	0.058*** (0.012)
Large Firm Dummy (100+ employees)	-0.110*** (0.007)	-0.121*** (0.008)	-0.093*** (0.009)	-0.038*** (0.010)	-0.050*** (0.011)	-0.017 (0.018)	0.072*** (0.011)	0.069*** (0.011)	0.081*** (0.019)
Age	-0.001*** (0.000)	-0.001*** (0.000)	-0.002*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.002*** (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Constant	0.148*** (0.008)	0.157*** (0.008)	0.168*** (0.008)	0.171*** (0.017)	0.157*** (0.016)	0.264*** (0.017)	0.025 (0.015)	0.006 (0.015)	0.110*** (0.014)
# of Firms	42024	24378	17646	34533	20141	14392	34517	20138	14379
Adjusted R-Sq	0.090	0.097	0.084	0.065	0.069	0.059	0.054	0.056	0.051
# of Countries	103	103	100	103	103	100	103	103	100

*, **, and *** represent significance at 10, 5, and 1% respectively.

Table 4: Establishment Size and Growth –Across Income Groups

The regressions estimated in this table are: Employment Growth/Sales Growth/Productivity Growth = a + b₀ Size Dummy for 20-99 employees + b₁Size Dummy for ≥100 employees + b₂ Age + Country Dummies + Sector Dummies + Year Dummies + e. Employment Growth is defined as the log difference in permanent, full-time employment over a two year period. Sales Growth is defined as the log difference in sales over a two year period and Labor Productivity Growth is defined as the log difference in labor productivity (Sales/Employment) over a two year period. In cols. 1, 5, and 9, we report results for a subpopulation of firms in low income countries. In cols. 2, 6, and 10, we report results for a subpopulation of firms in lower-middle income countries. In cols. 3, 7, and 11, we report results for a subpopulation of firms in upper middle income countries. In cols. 4, 8, and 12, we report results for a subpopulation of firms in high income countries. All data is at the firm level from the World Bank Enterprise Surveys. All regressions are OLS regressions with standard errors clustered at the country level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Employment Growth				Sales Growth				Productivity Growth			
	Low	Lower-Mid	Upper-Mid	High	Low	Lower-Mid	Upper-Mid	High	Low	Lower-Mid	Upper-Mid	High
Medium Firm Dummy (20-99 employees)	-0.071*** (0.009)	-0.088*** (0.008)	-0.085*** (0.009)	-0.026*** (0.007)	-0.025 (0.019)	-0.038** (0.014)	-0.028** (0.011)	0.037 (0.024)	0.040* (0.020)	0.051*** (0.014)	0.060*** (0.010)	0.059** (0.020)
Large Firm Dummy (100+ employees)	-0.129*** (0.016)	-0.107*** (0.011)	-0.117*** (0.012)	-0.056*** (0.007)	-0.012 (0.039)	-0.050*** (0.014)	-0.048*** (0.016)	0.027 (0.022)	0.108** (0.041)	0.056*** (0.011)	0.071*** (0.018)	0.083*** (0.022)
Age	-0.002*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001* (0.001)	-0.001 (0.001)	-0.001*** (0.000)	-0.001 (0.001)	0.001 (0.001)	0.001 (0.000)	-0.000 (0.000)	0.001 (0.001)
Constant	0.107*** (0.021)	0.165*** (0.014)	0.122*** (0.011)	0.103*** (0.016)	0.240*** (0.057)	0.196*** (0.030)	0.113*** (0.024)	-0.072** (0.027)	0.159*** (0.045)	0.036 (0.025)	-0.008 (0.022)	-0.147*** (0.024)
# of Firms	7825	14731	16943	2525	6966	12027	13478	2062	6963	12022	13470	2062
Adjusted R-Sq	0.093	0.102	0.085	0.044	0.106	0.049	0.059	0.025	0.102	0.044	0.036	0.024
# of Countries	29	34	31	9	29	34	31	9	29	34	31	9

*, **, and *** represent significance at the 10, 5, and 1% respectively.

Table 5: Establishment Size and Growth – Large vs. Small Informal Sector

The regressions estimated in this table are: Employment Growth/Sales Growth/Productivity Growth = $a + b_0$ Size Dummy for 20-99 employees + b_1 Size Dummy for ≥ 100 employees + b_2 Age + Country Dummies + Sector Dummies + Year Dummies + e. Employment Growth is defined as the log difference in permanent, full-time employment over a two year period. Sales Growth is defined as the log difference in sales over a two year period and Labor Productivity Growth is defined as the log difference in labor productivity (Sales/Employment) over a two year period. Cols 1-3 present results for countries that have a large informal sector (above the median value) and cols. 4-6 present results for countries with a small informal sector (below the median value) where informal sector is defined by the informal sector's contribution to GDP in Schneider et al. (2010). All data is at the firm level from the World Bank Enterprise Surveys. All regressions are OLS regressions with standard errors clustered at the country level.

	(1)	(2)	(3)	(4)	(5)	(6)
	Employment Growth	Sales Growth	Productivity Growth	Employment Growth	Sales Growth	Productivity Growth
	Large Informal Sector			Small Informal Sector		
Medium Firm Dummy (20-99 Employees)	-0.079*** (0.007)	-0.027** (0.012)	0.050*** (0.012)	-0.081*** (0.008)	-0.025** (0.010)	0.059*** (0.009)
Large Firm Dummy (100+ Employees)	-0.111*** (0.012)	-0.030** (0.015)	0.076*** (0.015)	-0.103*** (0.008)	-0.043*** (0.014)	0.064*** (0.013)
Age	-0.001*** (0.000)	-0.001*** (0.000)	0.000 (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	0.000 (0.000)
Constant	0.155*** (0.016)	0.225*** (0.036)	0.110*** (0.038)	0.132*** (0.009)	0.050*** (0.018)	0.045*** (0.014)
# of Observations	18245	15031	15027	21723	17860	17851
Adjusted R-sq	0.082	0.075	0.070	0.091	0.054	0.032
# of Countries	46	46	46	46	46	46

*, **, and *** represent significance at the 10, 5, and 1% respectively.

**Table 6: Establishment Size and Growth –
Stand-Alone Establishments vs. Establishments that are part of a larger firm**

The regressions estimated in this table are: Employment Growth/Sales Growth/Productivity Growth = $a + b_0$ Size Dummy for 20-99 employees + b_1 Size Dummy for ≥ 100 employees + b_2 Age + Country Dummies + Sector Dummies + Year Dummies + e. Employment Growth is defined as the log difference in permanent, full-time employment over a two year period. Sales Growth is defined as the log difference in sales over a two year period and Labor Productivity Growth is defined as the log difference in labor productivity (Sales/Employment) over a two year period. Cols. 1 to 3 present results for only single establishment firms. Cols. 4 to 6 present results for establishments that report being part of a larger firm. All data is at the firm level from the World Bank Enterprise Surveys. All regressions are OLS regressions with standard errors clustered at the country level.

	(1)	(2)	(3)	(4)	(5)	(6)
	Employment Growth	Sales Growth	Productivity Growth	Employment Growth	Sales Growth	Productivity Growth
	Single Establishment			Part of a larger firm		
Medium Firm Dummy (20-99 Employees)	-0.081*** (0.005)	-0.035*** (0.008)	0.047*** (0.007)	-0.096*** (0.017)	-0.008 (0.019)	0.087*** (0.021)
Large Firm Dummy (100+ Employees)	-0.113*** (0.007)	-0.045*** (0.009)	0.070*** (0.008)	-0.143*** (0.023)	-0.053** (0.026)	0.085*** (0.030)
Age	-0.002*** (0.000)	-0.001*** (0.000)	0.000 (0.000)	-0.001** (0.000)	-0.001* (0.000)	0.000 (0.000)
Constant	0.141*** (0.008)	0.200*** (0.017)	0.036** (0.016)	0.068*** (0.019)	-0.026 (0.063)	-0.081 (0.053)
# of Observations	35585	29387	29376	6057	4908	4905
Adjusted R-sq	0.093	0.068	0.055	0.111	0.059	0.052
# of Countries	102	102	102	101	101	101

*, **, and *** represent significance at the 10, 5, and 1% respectively.

Table 7: Establishment Size and Growth – Additional Robustness

The regressions estimated in this table are: Employment Growth/Sales Growth/Productivity Growth = $a + b_0$ Size Dummy for 20-99 employees + b_1 Size Dummy for ≥ 100 employees + b_2 Age + Country Dummies + Sector Dummies + Year Dummies + Country x Sector Dummies + e. Employment Growth is defined as the log difference in permanent, full-time employment over a two year period. Sales Growth is defined as the log difference in sales over a two year period and Labor Productivity Growth is defined as the log difference in labor productivity (Sales/Employment) over a two year period. In Cols. 1-3 we include country x sector interaction effects and use OLS regressions with standard errors clustered by country. In cols. 4 to 6 we use weighted survey regressions. In cols. 7 to 9 we use OLS regressions but cluster standard errors by survey strata. Adjusted R-squares are reported at the foot of the table except for the regressions in (7)-(9) where we report R-squares.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Employment Growth	Sales Growth	Productivity Growth	Employment Growth	Sales Growth	Productivity Growth	Employment Growth	Sales Growth	Productivity Growth
	Country x Sector Effects			Clustering by Strata			Weighted Survey Regressions		
Medium Firm Dummy (20-99 Employees)	-0.082*** (0.005)	-0.026*** (0.008)	0.056*** (0.008)	-0.080*** (0.004)	-0.025*** (0.007)	0.055*** (0.007)	-0.097*** (0.015)	-0.024 (0.056)	0.063 (0.055)
Large Firm Dummy (100+ Employees)	-0.112*** (0.007)	-0.039*** (0.011)	0.074*** (0.012)	-0.109*** (0.006)	-0.040*** (0.010)	0.069*** (0.010)	-0.071** (0.030)	-0.202 (0.162)	-0.144 (0.186)
Age	-0.001*** (0.000)	-0.001*** (0.000)	0.000 (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	0.000 (0.000)	-0.002*** (0.000)	-0.000 (0.003)	0.002 (0.003)
Constant	0.229*** (0.005)	0.363*** (0.007)	0.134*** (0.007)	0.148*** (0.022)	0.169*** (0.028)	0.023 (0.028)	0.178*** (0.032)	0.176** (0.077)	-0.012 (0.073)
# of Observations	42024	34533	34517	38986	31641	31627	38986	31641	31627
R-Sq (Adjusted R-sq)	0.096	0.075	0.061	0.086	0.067	0.055	0.076	0.068	0.070
# of Countries	103.000	103.000	103.000	99	99	99	99	99	99

*, **, and *** represent significance at 10, 5, and 1% respectively.

Table 8: Role of Establishment Age

The regressions estimated in this table are: Employment Growth/Sales Growth/Productivity Growth = $a + b_0$ Size Dummy for 20-99 employees + b_1 Size Dummy for ≥ 100 employees + b_2 Age Dummy for 6-10 years + b_3 Age Dummy for 11+ years + Country Dummies + Sector Dummies + Year Dummies + e. Employment Growth is defined as the log difference in permanent, full-time employment over a two year period. Sales Growth is defined as the log difference in sales over a two year period and Labor Productivity Growth is defined as the log difference in labor productivity (Sales/Employment) over a two year period. All data is at the firm level from the World Bank Enterprise Surveys. All regressions are OLS regressions with standard errors clustered at the country level.

	(1)	(2)	(3)
	Employment Growth	Sales Growth	Productivity Growth
Medium Firm Dummy (20-99 employees)	-0.077*** (0.005)	-0.021*** (0.008)	0.056*** (0.007)
Large Firm Dummy (100+ employees)	-0.112*** (0.007)	-0.036*** (0.010)	0.076*** (0.010)
Mid-Age Dummy (6-10 years)	-0.049*** (0.005)	-0.073*** (0.009)	-0.028*** (0.008)
Mature Firm Dummy (11+ years)	-0.075*** (0.006)	-0.082*** (0.010)	-0.010 (0.008)
Constant	0.170*** (0.008)	0.202*** (0.017)	0.036** (0.015)
# of Firms	42024	34533	34517
Adjusted R-sq	0.097	0.068	0.054
# of Countries	103	103	103

*, **, and *** represent significance at 10, 5, and 1% respectively.