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**BACKGROUND PAPER FOR THE
WORLD DEVELOPMENT REPORT 2013**

Firm Dynamics, Productivity Growth and Job Creation in Developing Countries: The Role of Micro- and Small Enterprises

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Firm Dynamics, Productivity Growth and Job Creation in Developing Countries

The Role of Micro- and Small Enterprises

Yue Li and Martin Rama¹

Growth occurs as jobs become more productive over time but also as more productive jobs are created and less productive jobs are destroyed. Dynamism at the enterprise level underlies this creative production process. In the case of advanced economies, the availability of high-quality data tracking enterprises over time has led to the accumulation of solid empirical knowledge on the relationship between firm dynamics, productivity growth and job creation. Recent years have witnessed a proliferation of studies on questions such as: which firms create more jobs? How much variation is there in firm productivity? or which firms drive productivity growth? While many gray areas remain, three decades of research have yielded an increasingly clear picture of enterprise dynamics, one in which most job creation is associated with young firms, some of which (the “gazelles”) experience rapid gains in productivity and employment, which makes them one of the most important sources of economic growth.

Micro-level data supposedly comparable to that of advanced economies is increasingly available in developing countries, mainly under the form of enterprise censuses and surveys compiled by official statistical agencies. International partners, including the World Bank, have made consistent efforts to support data collection and research along the lines of advanced economies. Similar questions on enterprise dynamics, productivity growth and job creation have been addressed in numerous studies. The quality of the data not being as high as in advanced economies, and the number of studies not being as large, the accumulated knowledge on developing countries is more tentative. But results tend to confirm the findings for advanced countries, for instance on the prevalence of simultaneous job creation and destruction, even when net employment does not change much. Results also suggest that in developing countries it is small and medium-size firms, more than young firms, which drive job creation. And the dispersion of productivity is higher than in advanced economies.

However, the censuses and surveys of developing countries generally cover formally registered firms, therefore excluding the vast majority of micro- and small enterprises which are typically informal. Reaching economic units which are not formally registered with the authorities is admittedly difficult, but the result is a disturbing “truncation” of the data. Because micro- and small enterprises are under-represented in the data, their contribution to job creation (and to job destruction) is not sufficiently appreciated. This under-representation also results in a distorted image of the contribution firm entry and exit make to aggregate employment and productivity. The truncation of the data makes the growth of some firms, or their formalization, to be perceived as entry; while declines in size or shifts to the informal sector can be misclassified as exits.

This paper re-examines the conventional wisdom on firm dynamics, productivity growth and job creation in developing countries, explicitly taking into account the role played by micro- and small enterprises (mostly informal). The paper first summarizes the existing literature on the topic, using the studies for advanced economies as the benchmark. It then reviews the studies conducted for developing countries using enterprise censuses and surveys which are formally similar to those of advanced countries, except that they are truncated. This review allows articulating the conventional view on

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enterprise dynamics in developing countries. Next, the paper relies on household surveys and labor force surveys to reconstruct the true distribution by size of economic units, and assesses the implications for empirical analysis. This assessment is in turn used to re-weight the samples of standard enterprise censuses and surveys, and to combine the resulting insights with those from studies on micro- and small enterprises.

The overall result is a new perspective on firm dynamics, productivity growth and job creation in developing countries. It appears that most job creation comes from micro- and small enterprises, even in high middle-income countries. However, job destruction is equally important in their case, as they rarely grow over time. Productivity dispersion is wide, but not as clearly correlated with firm size as in advanced economies, which indicates that gains from reallocation are being missed out. While churning is the norm among the smallest units, large ones can be stagnant. Gazelles are an exception; instead, a multiplicity of “mice” and a few “elephants” dominate the economic landscape. This reassessment of the conventional wisdom points to new directions on the research efforts needed to understand the role of micro- and small enterprises, and on the policies with the potential to foster job creation and productivity growth in developing countries.

Advanced countries as the benchmark

While the literature on job creation and destruction, firm productivity and firm dynamics is vast, for the purpose of this review it can be conveniently regrouped under three main questions. The first one, of direct interest to policy makers, is: which enterprises create more jobs? And its answer may refer to net job creation, or to gross job creation and destruction flows. A second question concerns the extent to which productivity varies across enterprises. If the dispersion is wide, who creates more jobs is relevant not only from an employment point of view, but also from the perspective of aggregate productivity gains. Finally, a third question concerns the relative contribution of firm entry and exit, productivity gains at the firm level, and labor reallocation across firms, to economic growth.

Question 1: which firms create more jobs?

Around the world, it is generally accepted that small and medium-sized enterprises are the main engine of job creation. Empirical work has indeed paid considerable attention to the role of firm size in employment generation, and Birch (1981, 1987) was the first to provide evidence in support of the standard claim for the US economy. However, his methodology was questioned on measurement and statistical grounds, in particular the regression to the mean effect (David and Haltiwanger, 1992). With improved methodology, David, Haltiwanger and Schuh (1996) found no systematic relationship between employment growth and plant size in the manufacturing sector. Their analysis was based on the Longitudinal Research Database over 1973-1988. But Neumark, Wall and Zhang (2009) revisited this question using the National Establishment Times Series between 1992 and 2004, and concluded that a negative relationship between establishment size and net job creation existed in both the manufacturing and the services sectors.

The validity of the standard claim becomes less clear when the age of enterprises is considered as well. Using the richer Census Bureau Business Dynamics Statistics and Longitudinal Research Database, Haltiwanger, Jamin and Miranda (2010) confirm that net job creation is larger among small establishments and a negative relationship between establishment size and net job creation exists. However, their results also indicate that the relationship is weaker when controlling for firm age. Younger firms exhibit higher rates of net job creation. Because the vast majority of young firms and startups are small there appears to be a relationship between size and job growth.

Net changes in employment hide a considerable amount of job creation and destruction. The magnitude of these gross employment flows was first highlighted by David, Haltiwanger and Schuh (1996). Each year, millions of jobs are created as a result of growth in existing businesses and the creation of new businesses; at the same time, millions of jobs are destroyed as businesses contract or close. According to Haltiwanger (2011), between 1980 and 2009, about 17 percent of all jobs in the US were created within the same year by expanding or entering business; simultaneously, about 15 percent of all jobs disappeared as a result of contracting or exiting businesses. Furthermore, 18 percent of gross job creation was accounted for by entrants and 17 percent of gross job destruction was due to firms exiting.

While the general claim that small and medium-sized enterprises are the main creator of jobs in net terms is questionable, it appears that micro- and small enterprises are the largest contributors to gross job flows. Neumark, Wall and Zhang (2009) and Haltiwanger, Jamin and Miranda (2010) both find a negative relationship between firm size and gross job flows. But again, age is a more important determinant than size. Haltiwanger, Jamin and Miranda (2010) further showed that rates of gross job creation and gross job destruction were indeed higher among younger firms.

Question 2: how much dispersion in productivity?

Simple economic models assume a representative firm, hence no dispersion of productivity other than that created by policy distortions. However, more complex models can account for industry equilibria with heterogeneous producers. For example, Nelson (1981) treats firms as entities that make technological bets with inherent uncertainties and end up with different productivities. Jovanovic (1982) models firms with a time-invariant efficiency parameter, implying that a firm's productivity varies initially but converges over time to a constant value. Ericson and Pakes (1995) extend the model to incorporate stochastic shocks, which can cause very productive firms to experience losses in efficiency. More recent approaches include those by Melitz (2003), and Asplund and Nocke (2006). These models vary in their assumptions regarding sunk costs, learning and the stability of productivity. But they all imply that over time more productive firms expand at the expense of less productive ones. As a result, a positive correlation between productivity and firm size can be expected.

Empirical results from advanced economies have consistently revealed a large dispersion of productivity even within narrowly defined industries. Syverson (2004) found that within industries at the four-digit SIC level in the US manufacturing sector, the average ratio of total factor productivity (TFP) between plants in the 90th and 10th percentile was 1.92. Using a revenue measure of TFP, Hsieh and Klenow (2009) found that the ratio was as high as 3.3; it was even higher when using a physical measure of TFP. Faggio, Salvanes, and Van Reenen (2010) documented that the dispersion of productivity within industries in the UK has trended upwards for the past couple of decades. Bartelsman, Haltiwanger and Scarpetta (2009a) exposed a large dispersion of both TFP and labor productivity within industries in France, Germany, Netherlands, the UK, and the US.

Based on simple economic models of the firm, it would be tempting to interpret this observed dispersion in productivity as the result of measurement error. However, detailed microeconomic case studies have documented wide productivity gaps for specific industries. Further, meaningful correlations emerge between the estimated productivity and wages, export success, and the use of modern technology (Bartelsman and Doms 2000). In line with the more complex models, empirical evidence following the decomposition proposed by Olley and Pakes (1996) confirms that a positive relationship between labor productivity and firm size exists at the industry level in France, Germany, the Netherlands, the UK, and the US (Bartelsman, Haltiwanger and Scarpetta, 2009a). The relationship is strongest in the US, where the average labor productivity is 50 percent higher than if employment was randomly allocated across firms within each industry. The corresponding figure for the Western European countries is between 20 and 30 percent, which indicates less allocative efficiency.

Question 3: which firms drive productivity gains?

Greater allocative efficiency among existing firms is only one of the mechanisms through which a country's aggregate productivity can grow. This is the so-called "between" effect—the increasing output shares of high-productivity plants and the decreasing shares of low productivity plants. Other mechanisms are productivity growth within existing firms, and the entry and exit of firms.

Assessing the relative contribution of these mechanisms has been a controversial matter. In their pioneering work, Baily, Hulten and Campbell (1992) found that the "between" effect accounted for a large share of aggregate productivity growth in manufacturing in the US. The decomposition method affects the findings, however. Using an improved method, Foster, Haltiwanger and Krizan (2001) concluded that the main contribution came from firm entry, while the contribution of the "between" effect was relatively small. In the retail sector, on the other hand, aggregate productivity growth was almost entirely driven by reallocation (Foster, Haltiwanger and Krizan, 2006). Griliches and Regev (1992) found similar results for the retail sector in Israel.

A study for multiple advanced economies relying on harmonized methodologies and indicators, by Bartelsman, Scarpetta, and Schivardi (2005) concluded that reallocation, entry and exit all contribute to aggregate productivity growth, but the magnitude of their contributions differs by industry. This study also found that surviving entrants expand more rapidly in the US than in other advanced economies, while low productivity entrants exit more rapidly. Additional evidence on the contribution of reallocation, entry and exit to aggregate productivity growth is provided by Bartelsman and Doms (2000), Ahn (2001), and Syverson (2011), among others.

The case of the US highlights the importance of understanding the life cycle of firms. An entire strand of literature analyzes this issue by assessing the validity of Gibrat's law, which states firm growth rates are independent of size (Gibrat 1931). Earlier empirical results based on data from the manufacturing sector tended to reject the law, suggesting instead that firm growth decreases with size (Sutton 1997). On the other hand, growth rates appeared to be independent of size in the case of hospitality industries in The Netherlands, suggesting that small-scale services could be different (Audretsch et al., 2004). Beyond the sectoral specifics, there is a growing consensus emerging from this literature that a life cycle exists at the firm level (Dunne, Roberts and Samuelson 1989, David Haltiwanger and Schuh 1996, Sutton 1997, Caves 2000).

Evidence on this life cycle in the manufacturing sector in the US was provided by Hsieh and Klenow (2012). Their study showed that 35-year old plants are on average almost ten times larger than they were at birth in terms of employment. These plants are also nine times more productive. Similar evidence was provided for all firms with paid labor in Portugal by Cabral and Mata (2003). They found that age plays an important part in shaping firm size distribution, while selection only explains a small part. The size distribution of young firms is highly concentrated in small values; as firms age, the distribution shifts to the right. The mode increases, as more firms become bigger. The firms that survive over time were initially larger than the rest, but the difference in initial sizes is small in comparison with the change due to firm aging.

Not all firms go through the same life cycle, however. An important insight by Birch and Medoff (1994) is the distinction between "mice", "gazelles" and "elephants". Gazelles are rapidly growing firms that account for much of the net growth in employment, and are also characterized by rapid productivity gains (Henrekson and Johansson, 2010; Acs, 2011). By contrast, mice are small firms which never grow much. And elephants are large and stagnant firms which may on occasion shed large numbers of jobs. The coexistence of mice and gazelles within the universe of firms cast doubts on the idea that startups are the main source of economic dynamism, as startups could belong in any of the two groups (Shane, 2009).

Besides, their chances of success depend not only on their own characteristics, but also on the characteristics of the metropolitan areas where they start up (Acs and Mueller, 2008).

Conventional wisdom on developing countries

Building on the rich literature for advanced economies, a growing number of empirical studies have tried to explore the relationship between firm size, firm dynamics, productivity growth and job creation in the context of developing countries.

Question 1: which firms create more jobs?

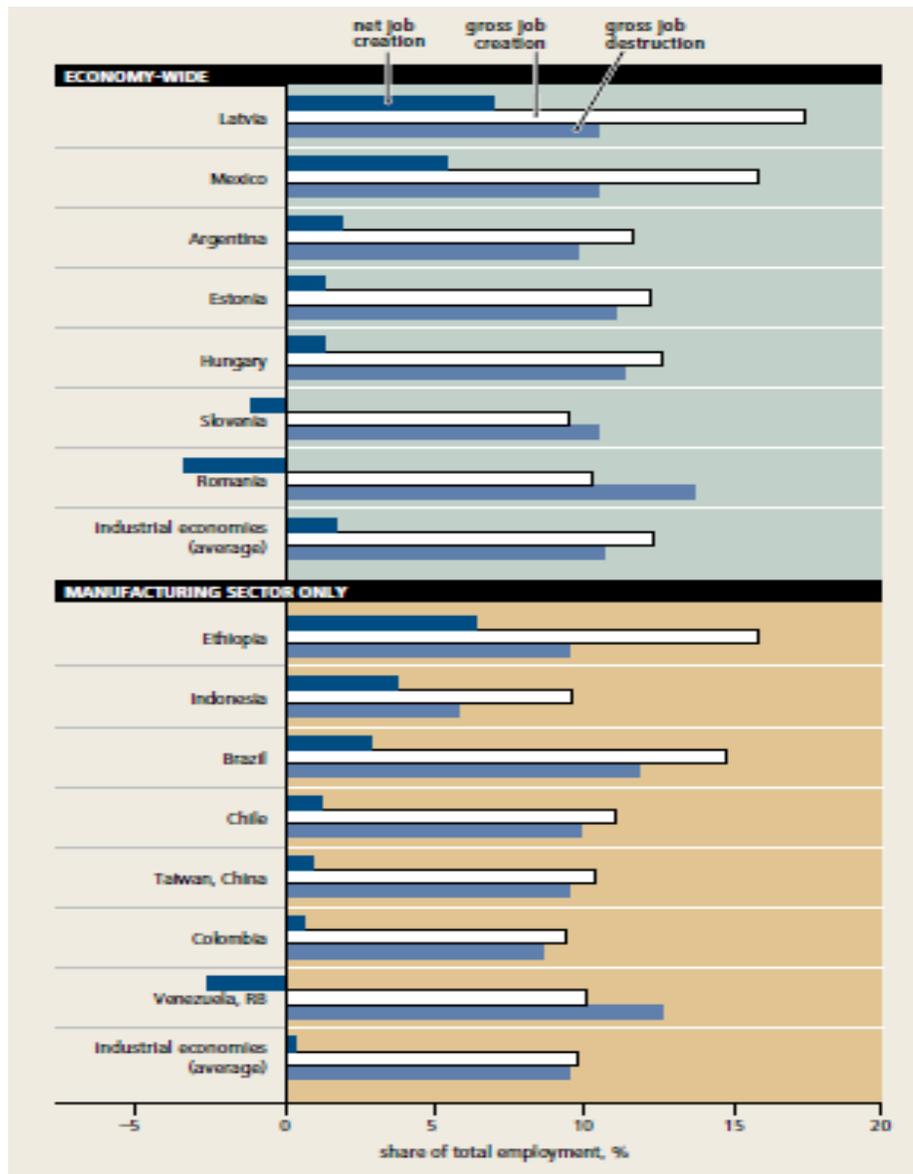
The transition from plan to market offers a useful laboratory to understand firm dynamics, as the restructuring of the state sector typically entails massive job destruction, while the emergence of a private sector should lead to substantial job destruction. A carefully review of the literature studying this process shows that it involved clearly different phases (Haltiwanger, Lehmann and Terrell, 2003). In early stages of the transition, job destruction was large and dominates job creation; subsequently, job creation picked up; eventually, the rates of gross job creation and destruction largely converged to the levels seen in the US.

Gross rates of job creation and destruction have said to be even higher in other developing countries, despite them not going through the turmoil experienced by transition economies. For instance, Roberts (1996) and Tybout (2000) document that the gross rates of job creation and destruction are greater in Chile, Colombia and Morocco than they are in the US. However, differences in methodologies and indicators often hinder cross country comparisons of this sort. Using a harmonized approach, Bartelsman, Haltiwanger, and Scarpetta (2009b) conducted a thorough analysis of establishment-level data from five transition economies from Central and Eastern Europe, six Latin American countries, and three emerging economies from East Asia.² This analysis revealed a high degree of employment turbulence in all countries, indicated by simultaneously large gross job creation and job destruction. In the manufacturing sector, between 7 and 20 percent of all jobs are created during the year, and a similar proportion is destroyed (Figure 1). These ratios are comparable to what is observed in the US and other advanced economies.

This literature also suggested that small and young private firms contribute disproportionately to job creation, and that a negative relationship between job creation and firm size exists in several countries. The first comprehensive study which sought to explore this relationship in developing countries, by Ayyagari, Demirgüç-Kunt and Maksimovic (2011b), was based on enterprise surveys from 99 countries. Its results confirm the importance of size, and not just age, in explaining employment growth. According to this study small firms, defined as with fewer than 100 employees, are the biggest contributors to job creation and also display the highest employment growth rates.

² The countries were Estonia, Hungary, Latvia, Romania and Slovenia in Central and Eastern Europe; Argentina, Brazil, Chile, Colombia, Mexico and Venezuela in Latin America; and Indonesia, the Republic of Korea and Taiwan (China) in East Asia.

Figure 1. Simultaneous job creation and destruction characterize all economies



Source: Bartelsman, Haltiwanger, and Scarpetta (2009) and Shiferaw and Bedi (2009). Data refer to the periods indicated in parentheses: Argentina (1996-2001), Brazil(1997-2000), Canada(1984-1997), Chile (1980-1998), Colombia(1983-1997), Estonia (1996-2000), Ethiopia (1997-2007), Finland (1989-1997), France (1989-1997), Germany (1977-1999), Hungary (1993-2000), Indonesia (1991-1994), Italy (1987-1994 and 1988), Latvia(1983-1998), Mexico(1986-2000), the Netherlands (1993-1995), Portugal (1983-1998), Romania (1993-2000), Slovenia(1991-2000), Taiwan, China (1986, 1991), United Kingdom(1982-1998), United States (1989-1991 and 1994-1996), and Venezuela, RB (1996-1998).

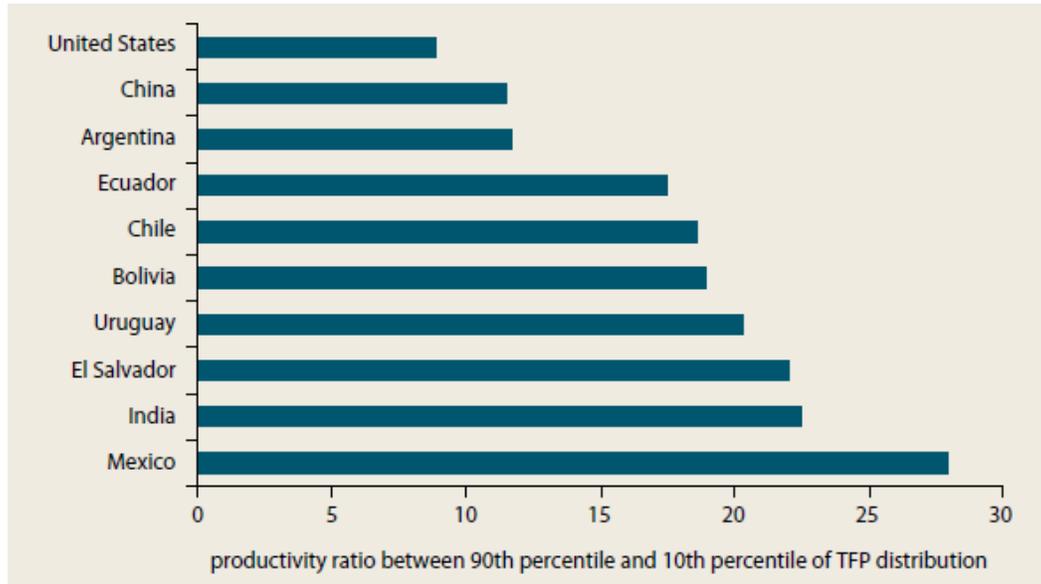
Question 2: how much dispersion in productivity?

When comparable establishment-level data is used, the dispersion of productivity is found to be much higher in developing countries than in advanced economies. This finding had been initially obscured by the reliance on comparisons involving different levels of aggregation for the data, different methodologies —for instance, stochastic or deterministic frontiers—, or different measures of

productivity. Thus, in a review on manufacturing firms in developing countries Tybout (2000) had concluded that productivity dispersion was not higher in developing countries, and that average deviations from the efficiency frontier were not typically larger than those observed in advanced economies.

A much cited study, by Hsieh and Klenow (2009), compared the dispersion of productivity within narrowly defined manufacturing industries in China, India and the US, and found it to be much higher in the former two countries. For China and India, the data are drawn from three rounds of annual surveys of manufacturing enterprises, with TFP measured based on both revenue and quantities. As a benchmark, in the US the TFP of a firm in the 90th percentile of the productivity distribution is about 8.9 times higher than that of a firm in the 10th percentile. By contrast, the ratio reaches 11.5 in China and a staggering 22.4 in India. Relying on the same methodology, Pagés (2010) computed firm- or establishment-level physical TFP in the manufacturing sector of seven Latin American countries and found even larger dispersion in these countries (Figure 2). While detailed data for other sectors is scarce, the dispersion of TFP among retail traders in Mexico and among communication and transportation businesses in Uruguay also appeared to be sizable.

Figure 2. The dispersion of productivity in manufacturing is greater in developing countries



Source: Pagés 2010.

A positive correlation is generally found between firm productivity and firm size, suggesting the existence of static allocative efficiency. Based on the World Bank Enterprise Surveys for developing countries, Ayyagari, Demirgüç-Kunt, and Maksimovic (2011a) documented that large firms are typically more productive than small firms. Using the same type of surveys, the World Bank (2012) replicated the approach for a broader sample of 102 developing countries, finding that firm size is positively correlated with labor productivity and export success. Across 47 developing countries, it also found that firm size is positively correlated with innovative activities such as developing new product lines, introducing new technology, outsourcing, and engaging in joint ventures with foreign partners.

However, the correlation between firm size and firm productivity is found to be lower in developing countries than in advanced economies, and especially so when market mechanisms are weak. For instance, Ayyagari, Demirgüç-Kunt, and Maksimovic (2011a) showed that large state-owned enterprises (SOEs) without foreign competitors are less productive and innovative than other large firms.

Transition economies provide further evidence on the importance of market competition. Bartelsman, Haltiwanger and Scarpetta (2009a) showed that the correlation between labor productivity and firm size within narrowly-defined manufacturing industries in Central and Eastern European countries was close to zero at the beginning of their transition. But the correlation increased substantially during the 1990s as market mechanisms gained in strength. Wang and Yao (1999) and Lin (2012) documented a similar pattern in China's case. In the 1990s, the new small township and village enterprises were found to be less productive than large and medium-size private companies, but more dynamic and productive than large SOEs. Their flexibility in decision making and responsiveness to market signals more than compensated for their lack of human and financial resources.

Question 3: which firms drive productivity gains?

A burgeoning literature has addressed the contribution of firm entry, firm exit, growth at the firm level and employment reallocation across firms to aggregate productivity growth in developing countries. For instance, Tybout (1996) showed that the productivity of exiting plants is much lower than the industry average in Chile, and that new entrants move up to industry average after three or four years in Colombia. Also for Chile and Colombia, Pavcnik (2002) and Eslava, Haltiwanger, Kugler and Kugler (2010) found that reallocation partly driven by trade reforms increased aggregate productivity. Aw, Chen and Roberts (2001) showed that the productivity differential between entering and exiting firms is an important source of industry-level productivity growth in the manufacturing sector of Taiwan (China), accounting for about a half of productivity growth for some industries. While new firms have generally lower productivity than incumbents, the more productive among them survive and converge to the average productivity level. As for exiting firms, they are less productive than survivors. Hallward-Driemeier and Thompson (2009a, b) found that unproductive firms are more likely to exit in the manufacturing sector of Morocco, and that both net entry and employment reallocation among incumbent firms contribute to productivity growth.

The evidence generally suggests that all four factors (entry, exit, growth and reallocation) make a positive contribution. Such is the conclusion of Haltiwanger et al. (2007) and Brandt, van Biesebroeck and Zhang (2012) in the case of China's manufacturing sector. Hallward-Driemeier and Rijkers (2011) reach a similar conclusion in Indonesia's case, although the contribution is different before and after Asian economic crisis.

The use of harmonized methodologies and indicators allowed Bartelsman, Haltiwanger and Scarpetta (2009b) to make meaningful comparisons between developing countries and advanced economies. Their results showed that the patterns were very similar in both cases. Overall, employment reallocation and firm entry and exit play a stronger role in promoting aggregate productivity growth in the longer term (defined as five years or more). The contribution of employment reallocation among incumbent firms is smaller than that of firm entry and exit. In most developing countries, the exit of low productivity firms is more prominent in promoting productivity growth, but in transition economies the entry of new firms often plays a more important role in promoting productivity growth. However, there is also evidence of substantial churning, meaning by that simultaneous entry and exit of firms that is not conducive to aggregate productivity growth.

Churning seems to be more common in Sub-Saharan African countries, especially among micro- and small firms. Using enterprise surveys from nine of these countries, van Biesebroeck (2005) showed that small firms rarely reach the top of the size and productivity distribution and contribute disproportionately little to aggregate growth, while large firms tend to grow faster.³ Using the same surveys for Ghana, Kenya and Tanzania, Soderbom, Teal and Harding (2006) further illustrated the divide between small and large firms. Efficiency contributes to the survival of large firms, but being relatively

³ The nine countries are Burundi, Cameroon, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Tanzania, Zambia and Zimbabwe. The data collection was coordinated by the World Bank as part of its Regional Program on Enterprise Development (RPED).

productive does not prevent small firms from going out of business. In Côte d'Ivoire, larger firms are less likely to exit (Klepper and Richmond, 2011). In Ghana, this is true for both larger firms and older firms (Frazer, 2005). In Ethiopia, Bigsten and Gebreyesus (2007) and Shiferaw (2007, 2009) showed that the mobility of formal manufacturing plants (with at least ten employees) across the size distribution is limited. Entry and exit take place predominantly among small firms, and the immediate contribution of this turnover to aggregate productivity does not appear to be very large.

The size distribution of firms

Even in advanced economies, the distribution of firms is skewed towards micro- and small enterprises. In the case of the US, this was shown by Neumark, Wall and Zhang (2009) using the National Establishment Times Series (NETS), which cover both employers and self-employment businesses, and report about 13.1 million firms and 14.7 million establishments in a typical year. According to this study, firms with fewer than 20 employees account for over 26 percent of total private sector employment and firms with fewer than 50 employees account for about 36 percent. Also for the US, using a rich dataset of employers based on the Census Bureau Business Dynamics Statistics and the Longitudinal Research Database (LRB), Haltiwanger, Jamin and Miranda (2010) documented that more than 35 percent of employment from startups is in firms with fewer than 20 employees, and more than 70 percent in firms with fewer than 50 employees.⁴ The picture is similar among advanced economies in Europe. According to the Structural Business Statistics database of EUROSTAT, firms with fewer than 20 employees account for about 37 percent of total private sector employment, and those with fewer than 50 employees for about 47 percent (EUROSTAT 2013).⁵

Micro- and small enterprises represent an even bigger share of the total in developing countries. Pagés (2010) reported that more than 80 percent of registered manufacturing establishments in Argentina, Bolivia, El Salvador, and Mexico have fewer than 10 employees. According to ADB (2010), about 90 percent of formal registered manufacturing establishments employ 5 to 59 workers in China, Indonesia, Korea, the Philippines, and Taiwan (China). Outside the manufacturing sector, the share of micro- and small enterprises is even higher. Again, Pagés (2010) reported that micro-enterprises alone account for 94 percent of the services sector of Mexico. Freund et al. (2012) showed that their share reaches about 98 percent of all private sector establishments in Tunisia. Using the World Bank Enterprise Surveys, Ayyagari, Demirgüç-Kunt and Maksimovic (2011b) concluded that small and medium enterprises are the largest contributors to total employment across developing countries.

However, these conclusions were derived from censuses and surveys of formal firms, which in principle span all size groups but have limited coverage of micro enterprises, especially the informal ones. Since most micro-enterprises in developing countries operate without formal registration with official authorities, reaching them through survey instruments is difficult. Also, most censuses and surveys in developing countries truncate their target population of firms from below, with thresholds typically varying from one to 20 employees. The focus on formal firms and the size thresholds imply that many more micro- and small enterprises are excluded from the datasets in developing countries than in advanced economies.

⁴ In a typical year, the Longitudinal Business Database reports report about 6 million firms and 7 million establishments with at least one paid employee. The Census Bureau also reckons more than 15 million self-employment businesses. It follows that NETS combines employer and self-employment businesses but does not reflect the universe of businesses.

⁵ The data is last updated on January 07, 2013. The numbers are weighted averages of data from Austria, Belgium, Cyprus, Finland, France, Germany, Italy, Luxembourg, Portugal, Spain, Sweden, Switzerland, and United Kingdom. The data cover total business economy, repair of computers, personal and household goods, except financial and insurance activities.

And yet, with very few exceptions, these are the datasets on which the conventional wisdom on developing countries is built. For example, the smallest size group in the analysis by Ayyagari, Demirgüç-Kunt and Maksimovic (2011b) is firms with fewer than 20 employees. In their data, the median employment share of enterprises in this size group across all countries is 17 percent, and the mean is 21 percent. These shares are below those observed in the US and advanced economies in Europe. Also, according to the data reported in that paper, firms in that size group account for 15 percent of private sector employment on average in eleven transition countries, with a maximum share of 22 percent in Estonia. However, according to the Structural Business Statistics database of the EUROSTAT, they account for over 40 percent of employment in the same sectors in these eleven countries (EUROSTAT 2013).⁶ The differences are largely driven by the fact that their data do not cover firms with zero to four employees and only take into account of permanent, full-time employment.

A straightforward way to grasp the importance of micro- and small enterprises in developing countries is to reconstruct the size distribution of firms out of household surveys and labor force surveys which are representative of the entire population. In a number of countries such surveys ask interviewees about the size of the businesses they work, including the possibility of just working on their own. Answers to this question can be used to estimate the distribution of businesses by size.⁷ This distribution differs quite dramatically from that implied by World Bank Enterprise Surveys (Figure 3).⁸ The share of micro-enterprises (defined as those with fewer than ten employees) is higher when relying on household and labor force surveys. But the gap with Enterprise Surveys is much larger for developing countries than for advanced economies. The comparison clearly indicates a higher concentration of micro- and small-firms in developing countries than in advanced economies. Further, the distribution based on household or labor force surveys is relatively stable over time while the distribution based on Enterprise Surveys fluctuates erratically for some countries.

The limited coverage of informal firms and the truncation of firms below certain threshold challenges the conventional wisdom in another important way. The literature on firm dynamics, productivity growth and job creation can mistakenly classify as firm “entry” what is in reality a transition from a smaller size, poorly captured by the survey, to a large size; or from informality to formality. Similarly, firm “exit” could actually be a transition into a smaller size that is out of the purview the census or survey. The dynamics of the incumbents only include growth of the relatively large firms above the official threshold. Because of the large number of micro- and small enterprises in developing countries this “truncation” of data can also lead to potentially seriously biased results.⁹

⁶ The data is last updated on January 07, 2013. The eleven countries are Bulgaria, Croatia, Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Romania, Slovak Republic and Slovenia. In this comparison, the data from EUROSTAT are limited to the sectors that are comparable to those used in Ayyagari, Demirgüç-Kunt and Maksimovic (2011b), namely, manufacturing, services, construction, transport, storage, communications, and computer and related activities.

⁷ The surveys of a number of countries ask both employers and employees about the size of their company. The size distributions that emerge from these two answers tend to be consistent with each other.

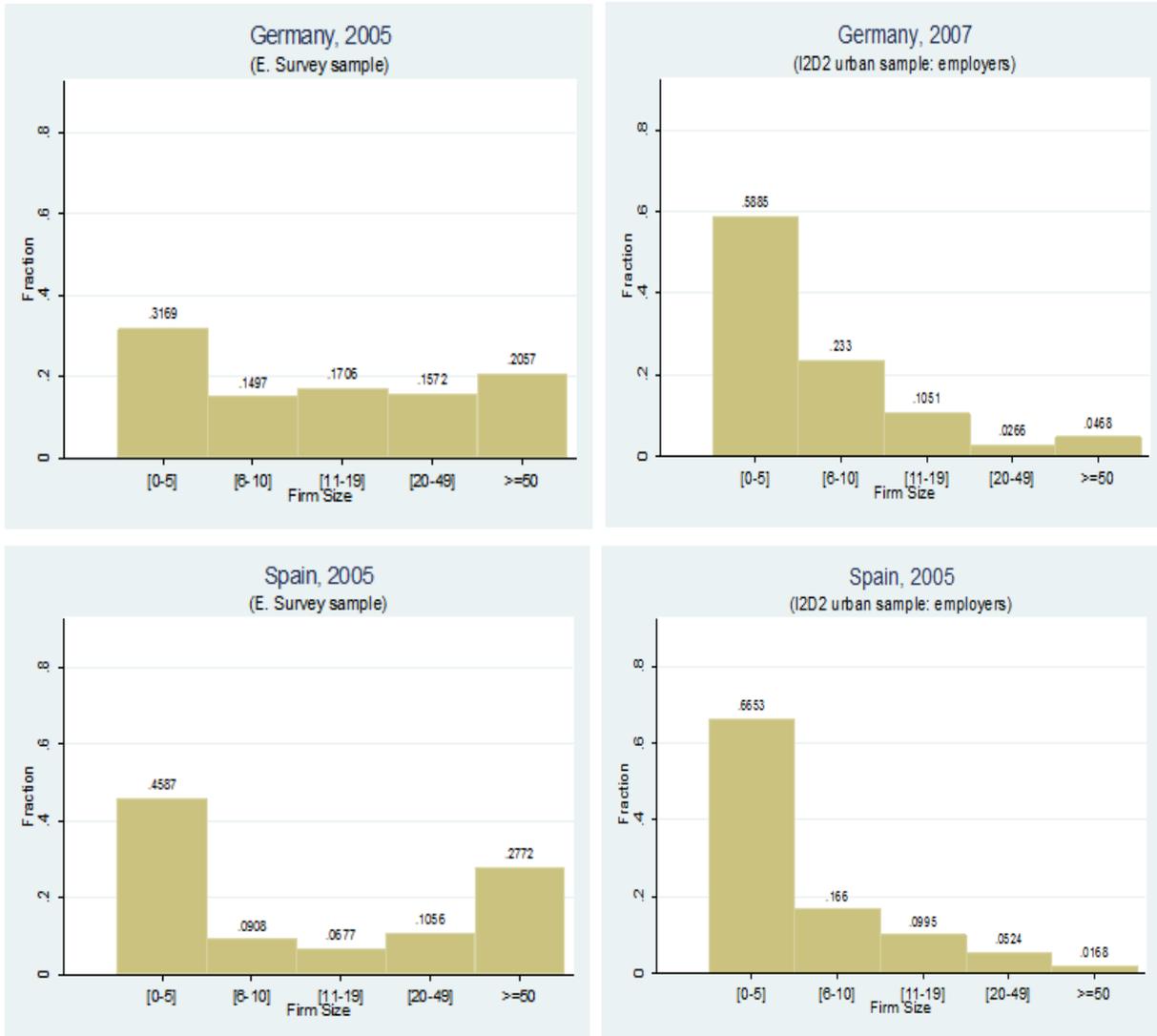
⁸ Results for two advanced economies (Germany and Spain) and five developing countries (Chile, India, Pakistan Turkey, and South Asia) are reported, but patterns are similar for other countries. As the classification of businesses by size differs across household and labor force surveys, the exercise regroups the size thresholds considered by World Bank Enterprise Surveys to make the classification comparable between the two types of surveys.

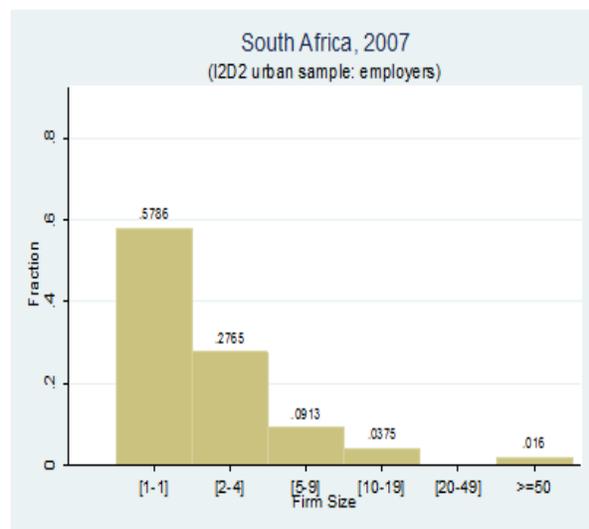
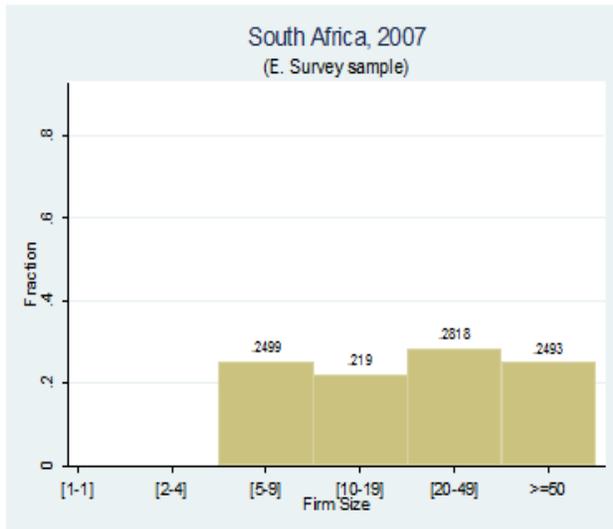
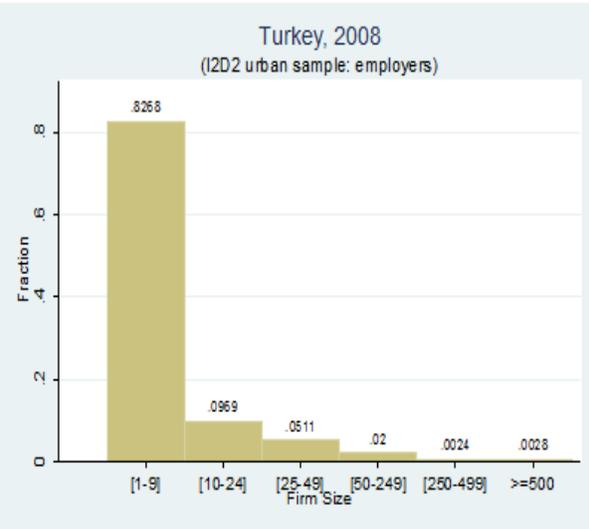
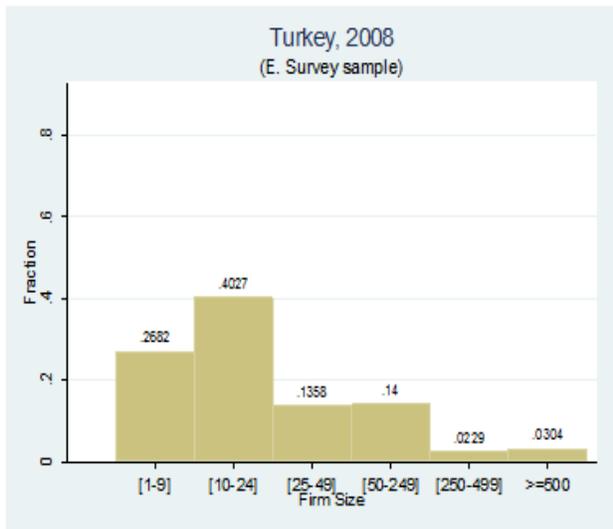
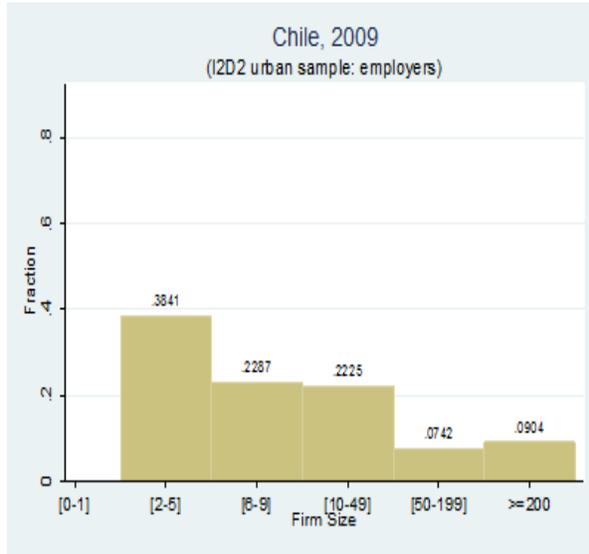
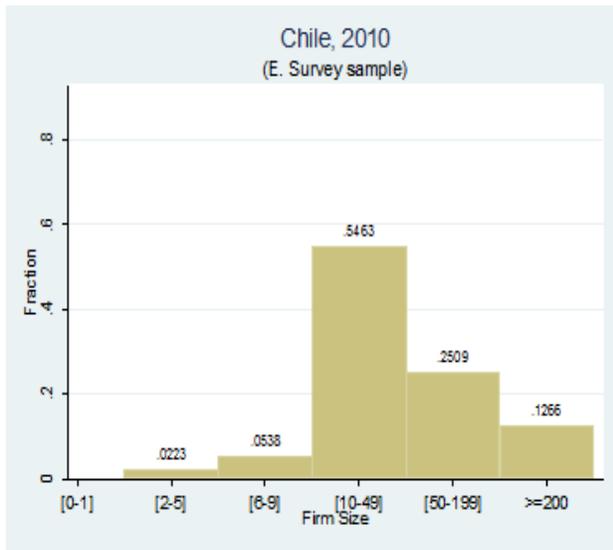
⁹ Bartelsman, Scarpetta, and Schivardi (2009) presents a comprehensive review of the measurement and analytical challenges of handling micro-level data, including the truncation problem.

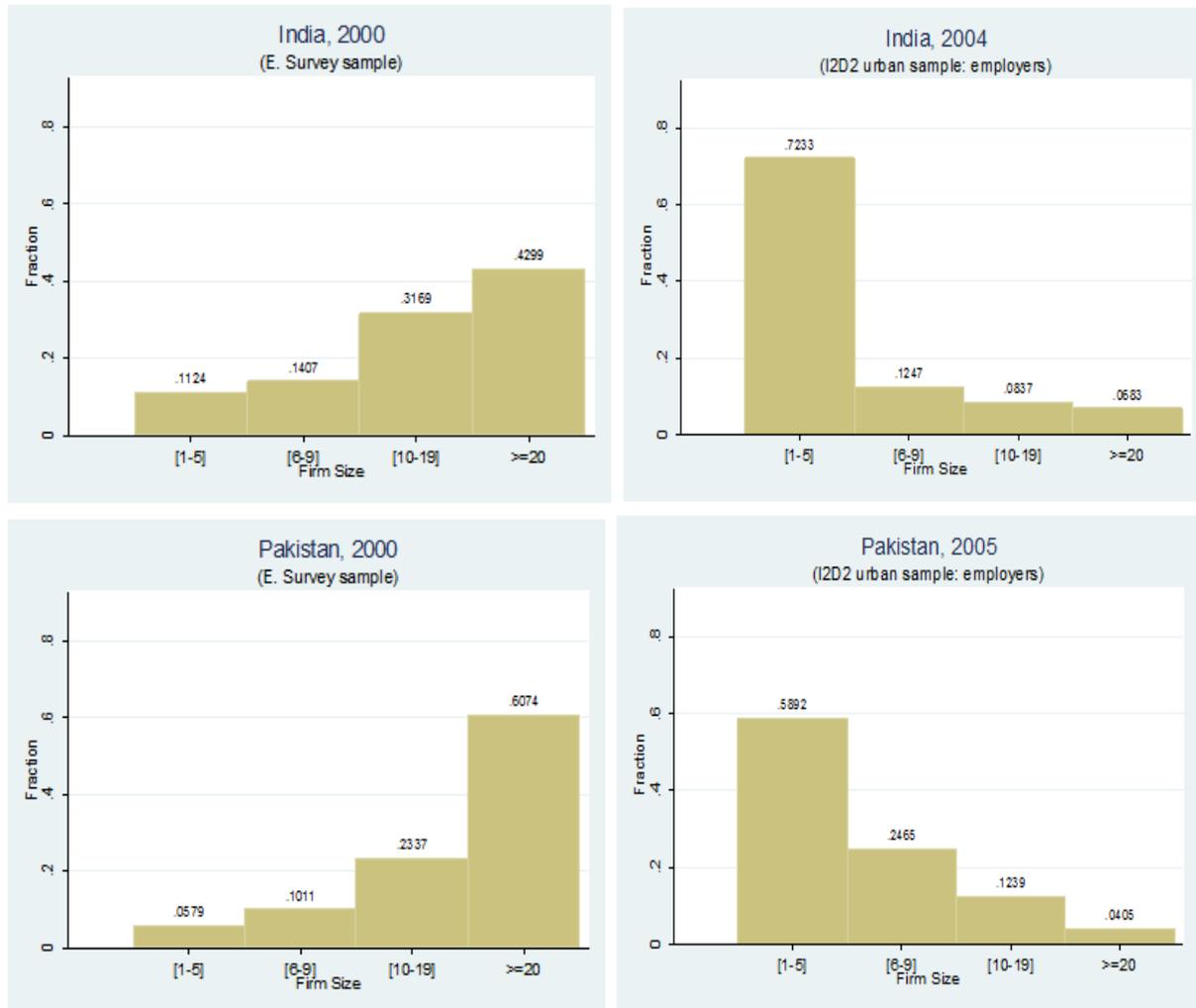
Figure 3. Enterprise surveys do not capture small businesses well

Enterprise surveys

Household and labor force surveys







Source: Authors' calculations.

The role of micro- and small enterprises

In developing countries, studies which are based on official enterprise censuses and surveys can give a distorted picture of firm dynamics, productivity growth and job creation, because they ignore, or at least underestimate, the contribution of micro- and small enterprises. But there are ways to correct that picture. Thus, the distribution of businesses by size estimated out of household and labor force surveys can be used to recalibrate the findings informing the conventional wisdom. In addition, in some developing countries detailed data are available about micro-enterprises and the informal sector. For instance, in India surveys on both formal and informal firms exist. Based on such surveys, ADB (2010) estimates that there are over 14 million informal enterprises in the manufacturing sector; this is more than four times the number of formal enterprises. Last but not least, recent years have seen an increasing number of empirical studies on informal sector, microenterprises and household enterprises. These multiple sources can be used to reconsider the conventional wisdom on developing countries.

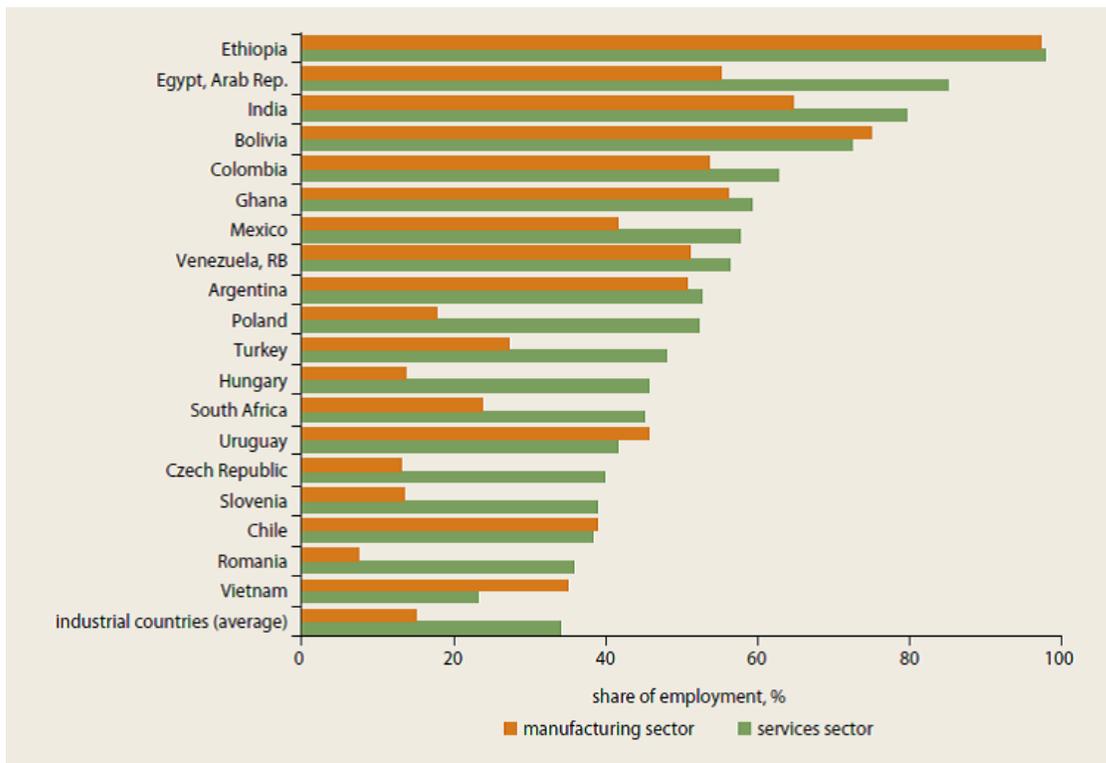
Question 1: which firms create more jobs?

Individual observations from enterprise surveys typically need to be weighted to generate aggregate figures. This is to account for the fact that only a subset of enterprises are covered by the survey samples, especially in the case of smaller firms. The size distribution of firms constructed out of household and labor force surveys can be used to recalculate those weights.

World Bank (2012) applied this methodology to reconstruct the distribution of employment by the size of the business they work for. In the case of advanced European economies the results can be compared to statistics from EUROSTAT as a robustness check. The results show that micro-enterprises alone account for the bulk of employment, even in middle-income countries (Figure 4). For example, in the manufacturing sector of Ethiopia micro-enterprises account for a staggering 97 percent of employment. But even in the manufacturing sector of Chile, an upper middle-income country which has already joined the Organisation for Economic Cooperation and Development, their employment share is about 39 percent. With a few exceptions, the employment share of micro-enterprises in the services sector is higher than in manufacturing. Even in transition economies, where private sector entry is only two decades old, microenterprises account for 10 to 20 percent of employment in manufacturing and for 30 to 50 percent of employment in services.

Further evidence on the of the important role micro-enterprises play in total employment was provided by Fox and Sohnesen (2012), based on surveys of household enterprises in nine Sub-Saharan African countries. Their study shows that almost all the labor force participants from low-income groups are engaged in household-based activities or in informal enterprises. Banerjee and Duflo (2011) and Grimm, Kruger and Lay (2011) presented similar evidence going beyond sub-Saharan Africa.

Figure 4. The employment share of micro-enterprises is greater in developing countries



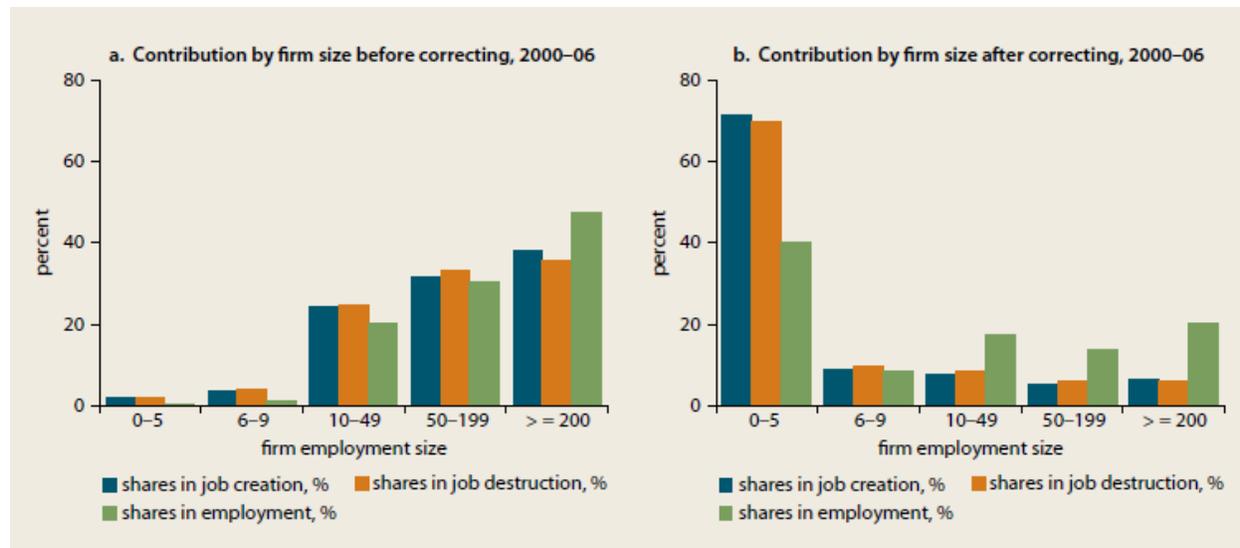
Source: World Bank (2012).

The reweighting of individual observations from household surveys can also be used to estimate aggregate job creation and destruction by size. World Bank (2012) applied this approach to Chile’s national survey of manufacturing enterprise, the Annual National Industrial Survey, which captures more than 90 percent of employment among establishments with more than 50 employees but less than half among establishments with 10 to 49 employees, and only a fraction of the nearly 300000 workers in microenterprises. When the original survey weights are used, it appears that larger firms account for most gross job creation and job destruction. But when weights are recalculated based on the size distribution of businesses emerging from Chile’s main household survey, it is micro-enterprises which contribute to the bulk of gross job flows (Figure 5). This estimate should not be taken literally, because the microenterprises for which information on job creation and destruction is available in the Annual National Industrial Survey are not necessarily representative. But even with this caveat, the difference is so large that it changes the picture of job creation and destruction.

Question 2: how much dispersion in productivity?

Measuring the productivity of micro-enterprises is difficult, but labor earnings and other dimensions of the quality of jobs provide indirect evidence on their performance. Numerous studies have documented that the micro- and even small-enterprises of developing countries tend to be a means of subsistence for the poor. Based on household surveys from 18 developing countries, Banerjee and Duflo (2011) found that 44 percent of the people living on fewer than US\$1 a day in urban areas, and 24 percent of those in rural areas, work in a nonagricultural business where they secure dismally low earnings. A majority of these businesses have little capital and lack a fixed address.

Figure 5. Micro-enterprises account for most job creation and destruction



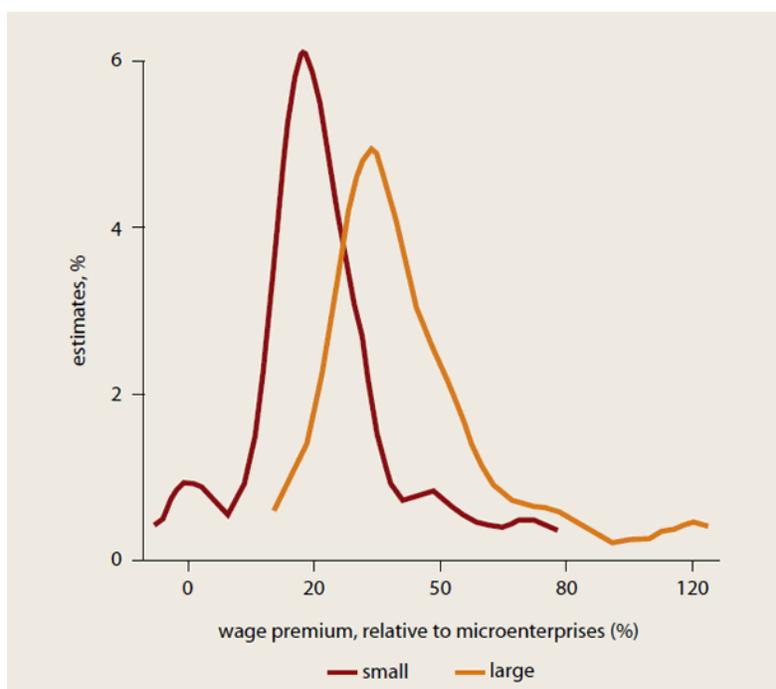
Source: World Bank (2012).

A vast literature has documented that pay is lower in informal businesses than in formal firms. Good summaries of this literature are provided by Leontaridi (1998), Perry et al. (2007), and Ruffer and Knight (2007), among others. Using data from household and labor force surveys in 33 developing countries, Montenegro and Patrinos (2012) showed that labor earnings in micro-enterprises are lower than in small and medium-sized firms, even after controlling for worker characteristics such as their age and

education (Figure 6). These findings are consistent with results from country and regional studies (e.g. Van Biesebroeck, 2005).

Studies on the assets of micro-enterprises in developing countries provide further evidence on their low productivity. Using Mexico’s National Survey of Micro Enterprises, McKenzie and Woodruff (2006) found that the median investment of new firms is very low in some sectors. For instance, it is below US\$100 in construction and personal services, which is less than half of the monthly earnings of a low-wage worker. Based on surveys from seven Sub-Saharan African countries, Grimm, Kruger and Lay (2011) showed that the median capital stock of an urban informal enterprise was less than US\$80.¹⁰ And based on surveys of household enterprises in nine Sub-Saharan African countries, Fox and Sohnesen (2012) documented that 25 to 45 percent of them use home as their primary point of operation, and another 10 to 40 percent simply work on the street.¹¹ Many of these micro- and small firms are located in rural areas, and absorb some labor slack during the low agriculture season, which is consistent with the findings of earlier studies, including Mead and Liedholm (1998) and Liedholm (2002).

Figure 6. Labor earnings are lower in micro-enterprises



Source: Montenegro and Patrinos (2012).

¹⁰ Returns on these very small assets can be considerable, however. Based on Mexico’s National Survey of Micro Enterprises, McKenzie and Woodruff (2006) reported return rates of 15 percent per month for investment levels below US\$200. Using data from a randomized experiment in Guanajuato (Mexico), McKenzie and Woodruff (2008) estimated the average return to capital in microenterprises to be in the range of 20 to 33 percent a month, which is three to five times higher than market interest rates. Also using data from a randomized experiment in Sri Lanka, Del Mel, McKenzie and Woodruff (2008) found the average return to capital in microenterprises to be 4.6 to 5.3 percent per month—substantially higher than market interest rates. Göbel, Grimm and Lay (2011) and Grimm, Kruger and Lay (2011) reported similar results for microenterprises in Peru and sub-Saharan African countries respectively.

¹¹ The core analysis of the paper is based on nationally representative household survey data from Burkina Faso, Cameroon, Republic of Congo (urban only), Ghana, Mozambique, Rwanda, Senegal, Tanzania, and Uganda.

Note: Data are from 138 household and labor force surveys spanning 33 countries over 1991-2010. The premium is estimated based on an earnings equation, controlling for worker characteristics. Large firms employ more than 50 workers and small firms 10 to 50 workers.

However, there is considerable dispersion in performance among micro-enterprises. In the seven Sub-Saharan African countries covered by their study, Grimm, Kruger and Lay (2011) showed that the average capital stock among the top quintile of urban informal enterprises is more than 60 times the median capital stock. The average monthly profit of this group is seven times the median.

The dispersion in performance among micro-enterprises is also revealed by the labor earnings they provide. Using data from employment and labor force surveys in Brazil, Mexico and South Africa, Bargain and Kwenda (2011) showed that some self-employed workers receive a significant earnings premium that may compensate for the absence of the benefits typically associated with formal jobs. However, the relative size of this group varies considerably across countries. Most of the self-employed enjoy an earnings premium in Mexico, but few do so in South Africa. Using a household survey panel from Vietnam, Nordman, Nguyen and Roubaud (2011) showed that labor earnings in the informal sector varied depending on job status: informal self-employed workers generally receive a premium relative to formal wage workers, and the premium becomes higher when moving up the pay ladder. Using data from a survey on micro- and small enterprises in Madagascar, Nordman, Rakotomanana, and Roubaud (2012) found qualitatively similar results: earnings in the informal sector vary depending on the worker's job status and most of the self-employers enjoy an earnings premium.

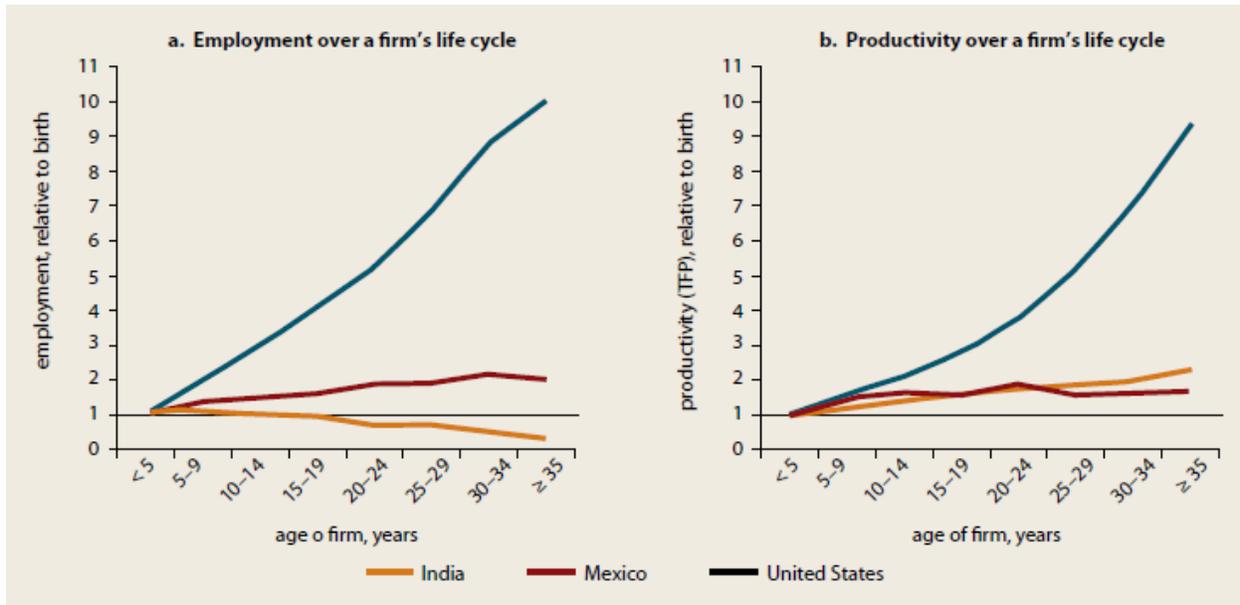
These results imply an even higher level of productivity dispersion and a less clear relationship between productivity and size distribution than the conventional wisdom suggests.

Question 3: which firms drive productivity gains?

Recent studies have tried to gain a deeper understanding of the life cycle of firms, including micro-enterprises, in the context of developing countries. Some of these studies have been able to overcome the above limitation of official censuses and surveys by either using census with a comprehensive coverage, or merging data sets of formal firms with those of informal firms. Others (admittedly a handful only) have relied on data specifically allowing them to analyze the dynamics of micro-enterprises and informal businesses. The overall picture that emerges from these studies is one where a multitude of subsistence endeavors coexist with much fewer entrepreneurial ventures (Perry et al. 2007, Nichter and Goldmark 2009, Schoar 2010).

Using comprehensive datasets, covering micro- and small enterprises, Hsieh and Klenow (2012) compared the life cycle of manufacturing plants in India and in Mexico, relative to that observed in the US. For India, they merged the Annual Survey of Industries, a census of manufacturing plants with at least 100 employees supplemented by a random sample of formally registered establishments with fewer than 100 employees, with the Survey of Informal Establishments of the National Sample Survey. For Mexico, they relied on the Mexican Economic Census, which is a complete enumeration of all fixed establishments in Mexico. The only establishments not included in the Economic Census are street vendors, which are unlikely to be important for manufacturing. Following cohorts of firms over their life cycle, the study showed that the average employment of 35-year old plants was one-fourth of employment at birth in India; and twice employment at birth in Mexico. Productivity growth displayed similar patterns in both countries. This is in sharp contrast to what observed in the US where, by age 35, both plant size and productivity are about eight times higher on average (Figure 7).

Figure 7. The majority of firms grow little in developing countries



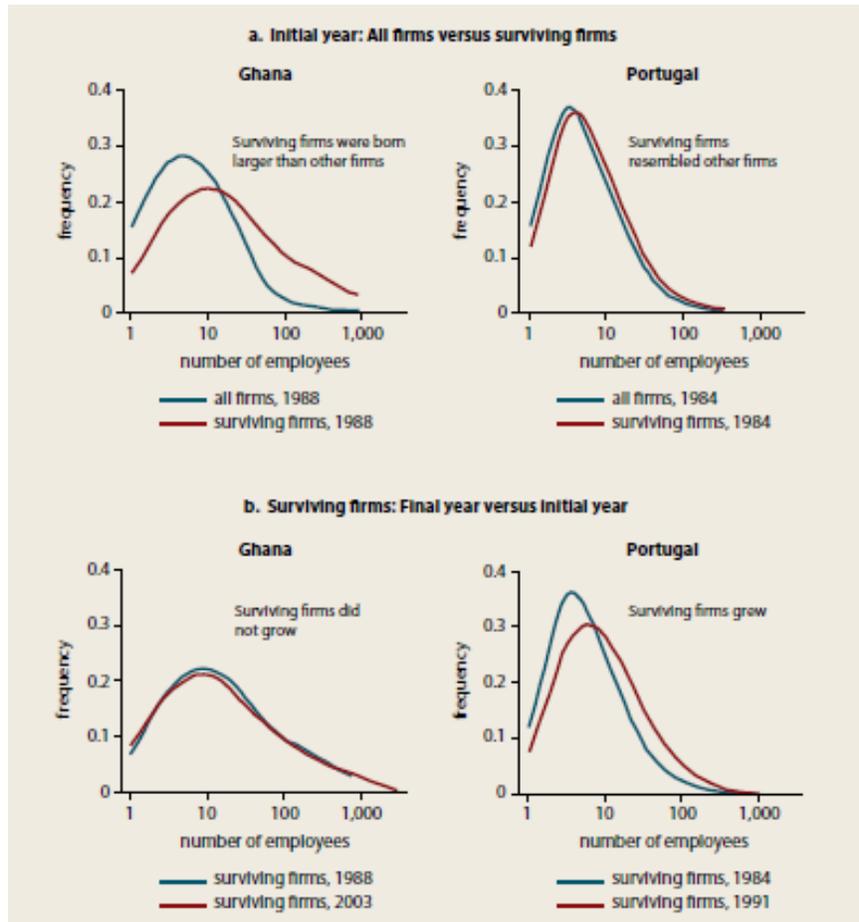
Source: Hsieh and Klenow (2012).

A similar comparison, this time involving a sub-Saharan African country, was attempted by Sandefur (2010). The data were from the Ghana's National Industrial Census, which incorporates all manufacturing firms in the country, both formal and informal (household enterprises are excluded though). Following the work on Portugal by Cabral and Mata (2003), changes in the size distribution of firms between 1987 and 2003 are decomposed into changes due to selection among entrants and changes due to aging of surviving firms. The results showed that in Ghana's case the evolution of firm size over time is almost entirely driven by selection and not by aging. The Ghanaian firms which survived from 1987 to 2003 are abnormally large to begin with and do not constitute a representative sample of the universe of firms. On average, the growth of these surviving firms was negative. This is the opposite of what had been observed in Portugal's case (Figure 8).

A number of studies have corroborated the lack of dynamism of micro- and small-firms in the informal sector. Using Mexico's National Urban Employment Survey, Fajnzlber, Meloney and Rojas (2006) found that individuals starting micro-enterprises are much more likely to remain the sole worker than to hire other workers and increase the size of their business. Following the same cohort of own-account firms between 1987 and 2001, they documented that about 52 percent of them stayed at the same scale while only 0.7 percent grow to become enterprises with at least five employees. In sub-Saharan African countries, Fox and Sohnesen (2012), Grimm, Kruger and Lay (2011), Kinda and Loening (2008) and Loening and Imru (2009) showed that few household enterprises expand into employing beyond the household, even when they are able to survive a long time.

The picture that emerges from studies explicitly taking into account micro- and small enterprises is one of much more limited firm dynamism over time, compared to advanced economies. Micro- and small enterprises constantly churn through entry and exit, creating many jobs but destroying almost as many, and contributing little to aggregate productivity growth along the way. More often, incumbent firms tend to be born large, and grow little. Thus, there are many mice and quite a few elephants, but gazelles are rare.

Figure 8. Aging does not contribute much to firm growth



Source: Cabral and Mata (2003) and Sandefur (2010).

Conclusion

The analysis in this paper, while preliminary, has potentially important implications for both research and policy. On the research front, the truncation of the enterprise censuses and surveys on which the conventional wisdom is based calls for an effort to collect better information on micro- and small enterprises. There have been creative efforts that could be emulated in a more systematic manner. They include collecting data on micro-enterprises from household and labor force surveys and developing survey instruments which adequately cover the informal sector.

For instance, Liedholm and Mead (1994, 1999) constructed a thorough data base of micro- and small-firms by visiting every house in a geographic area and collecting data whenever a business was encountered. Fajnzlber, Meloney and Rojas (2006) combined information from labor force surveys with surveys on micro-enterprises. Kinda and Loening (2008) and Loening and Imru (2009) focused on rural enterprises, which tend to be informal and small. Fox and Sohnesen (2012) collect and analyze information on household enterprises. And Cling, J. P., Razafindrakoto, M., & Roubaud, F. (2003) have produced so-called 1-2-3 surveys, a mix of household and enterprise surveys specifically designed at capturing the informal sector.

On the policy front, many recommendations on job creation and productivity growth are based on the conventional wisdom, therefore ignoring the role of micro- and small enterprises. Even when there is awareness that “informal is normal”, there is a tendency to think in the terms of a dual economy model, where the growth of the modern sector leads to the eventual disappearance of subsistence units. The consequence is a focus on revamping formal sector regulations, even if many of these regulations are irrelevant for informal micro- and small enterprises. Often, the emphasis is on bigger firms, on the ground that they tend to be more productive, but that amounts to ignoring that bigger firms can be “elephants”. While there are notable exceptions, such as Nichter and Goldmark (2009) or Syverson (2010), little thinking goes into policies to help more “gazelles” emerge. Such policies may not depend on regulation as much as on the ways in which global integration or urban development can create the conditions for micro- and small enterprises to become an engine on net job creation and productivity growth.

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