Jobs and productivity

Reallocation from low- to high-productivity jobs matters more for growth in developing countries, where differences in productivity across sectors and within sectors are wide. But reallocation often amounts to little more than churning.

Productivity growth happens as jobs become more productive, as new high-productivity jobs are created, and as low-productivity jobs disappear. In the medium term, trends in employment align closely with trends in the labor force, so there is no such a thing as jobless growth. But the short-term relationship between employment and growth is more complex. Large numbers of jobs are being created and destroyed simultaneously, leading to structural change and spatial labor reallocation. Underneath these sectoral and spatial changes are firm dynamics that result in a constant restructuring and reallocation of resources, including labor.

In developing countries, many people work in very small and not so dynamic economic units. Family farms, which often predominate in agriculture, average only 1.2 hectares in Asia, and 1.8 hectares in Sub-Saharan Africa. Outside of agriculture, microenterprises and household businesses account for a large share of employment in a majority of developing countries. These businesses make a significant contribution to gross job creation and destruction, although not necessarily to net job creation and productivity growth.

In agriculture, the Green Revolution has led to higher cereal yields and to employment growth because the new technologies are labor intensive. The progress has been uneven across regions, however. In Sub-Saharan Africa, the Green Revolution has not taken place on a large scale.

Outside of agriculture, productivity varies substantially across enterprises, implying potentially large productivity gains from job reallocation. The speed at which productivity grows also varies. Large firms are more innovative, provided that they are exposed to competition. At the other end, microenterprises are a diverse group. A vast majority of them, more prone to churning than to growth, are a means of survival for the poor. Yet some are entrepreneurial, and their success could boost wage employment.

Employment turbulence, not jobless growth

Jobless growth is a popular notion, often believed to be grounded on data. However, unemployment rates neither explode nor vanish over time, so employment trends align closely with trends in the size of the labor force. The growth of gross domestic product (GDP) certainly matters for employment growth, but in the medium term it matters less than demographics and participation rates. Data from 97 countries over the past decade confirm that a positive relationship exists between the growth of GDP per capita and the growth of employment per capita (figure
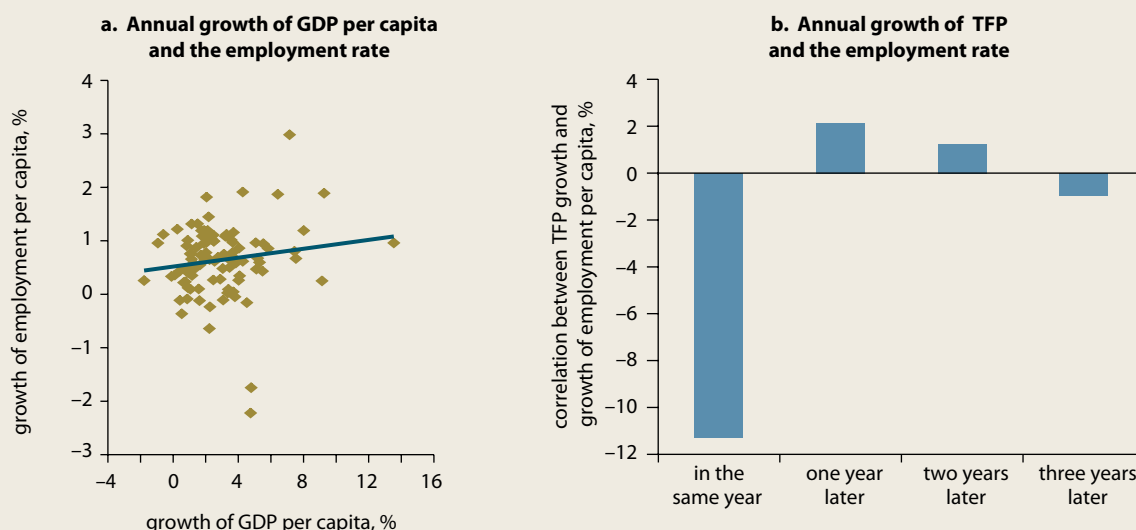
3.1a).[1] The relationship is not very strong, but only in very few cases was growth truly jobless.

On the other hand, the short-term relationship between growth and employment is not so straightforward. Growth happens partly through the disappearance of low-productivity jobs as well as through the creation of more productive jobs.[2] So for the same sample of countries over the same decade, surges in total factor productivity (TFP) in one year were in-

deed associated with a decline in employment in the same year (figure 3.1b). Only in subsequent years did this negative employment effect wane.

Productivity growth is a turbulent process. Analyses covering economies as different as Ethiopia and the United States in different periods over the past three decades reveal the magnitude of gross job creation and gross job destruction (figure 3.2). In the manufacturing sector of developing countries, between 7 and

FIGURE 3.1 *Economic growth does not occur at the expense of jobs in the medium term*

a. **Annual growth of GDP per capita and the employment rate**

b. **Annual growth of TFP and the employment rate**

Source: World Development Report 2013 team estimates based on average growth decomposition accounting for years 1999–2009.
Note: GDP = gross domestic product; TFP = total factor productivity. Data are from 97 countries. Panel a presents the relationship between annual growth of GDP per capita and the growth of the employment-to-population ratio. Each dot represents a country. Panel b depicts the correlation between annual growth in total factor productivity (TFP) and employment rate growth in the same year, and in subsequent years.

FIGURE 3.2 *Simultaneous job creation and destruction characterize all economies*
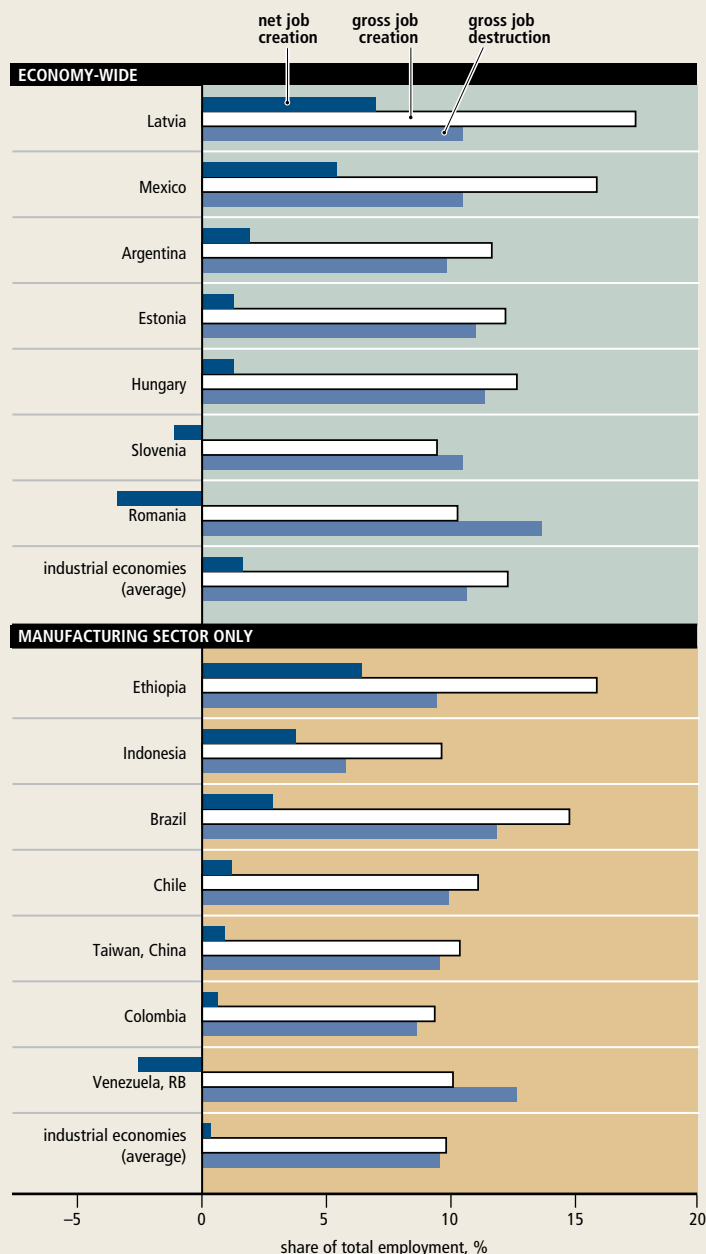
Sources: World Development Report 2013 team estimates based on Bartelsman, Haltiwanger, and Scarpetta 2009b and Shiferaw and Bedi 2010.
Note: The figure shows annual job flows. Data are from Argentina (1996–2001); Brazil (1997–2000); Canada (1984–97); Chile (1980–98); Colombia (1983–97); Estonia (1996–2000); Ethiopia (1997–2007); Finland (1989–97); France (1989–97); Germany (1977–99); Hungary (1993–2000); Indonesia (1991–94); Italy (1987–94); Latvia (1983–98); Mexico (1986–2000); the Netherlands (1993–95); Portugal (1983–98); Romania (1993–2000); Slovenia (1991–2000); Taiwan, China (1986–91); the United Kingdom (1982–98); the United States (1986–91, 1994–96); and República Bolivariana de Venezuela (1996–98).

20 percent of jobs are created every year, while a similar proportion disappear.[3] Even when aggregate employment was declining, as in the 1990s in Romania and Slovenia and in the manufacturing sector of República Bolivariana de Venezuela, many new jobs were being created. Conversely, when aggregate employment was growing by 6 percent in Mexico, jobs were disappearing at almost twice that rate.

Job flows may be associated with profound transformations in the sectoral structure of the economy. Technological change often occurs for specific products and processes, causing productivity to grow at different paces in different sectors. However, the relative weight of different sectors in the economy is determined not only by technological progress, but also by market demand and nonmarket forces. When there is an expansion of the most productive sectors, aggregate productivity increases. This composition effect, called productivity-enhancing structural change, is well documented in the case of labor shifts from agriculture to industry and services. Analysis based on more disaggregated data suggests that reallocation of labor across sectors has also been an important driver of productivity growth in several fast-growing East Asian countries. In China, it contributed 4.1 percentage points of the 7.3 percent annual growth in aggregate labor productivity over the past decade; in Vietnam, it accounted for 2.6 points out of 4.2 (figure 3.3).[4]

Job flows are also associated with changes in the spatial distribution of employment. The structural shift from agriculture in rural areas to industry and services in towns and cities may be the most visible example of spatial labor reallocation, but it is not the only one.[5] Even within sectors, job flows often have a strong spatial dimension. New plants associated with more innovative activities tend to start in large, diversified cities—incubators—with a higher density of suppliers and labor, and more fluent exchanges of information. As they mature and become more self-sufficient in information, these plants move to smaller cities, where land and wage costs are lower. As a result, many medium and small cities tend to be more specialized.[6]

The extent of spatial relocation varies across sectors and countries. For instance, in the Republic of Korea, manufacturing dominance in

FIGURE 3.3 *Labor reallocation across sectors was a driver of productivity growth in East Asia*
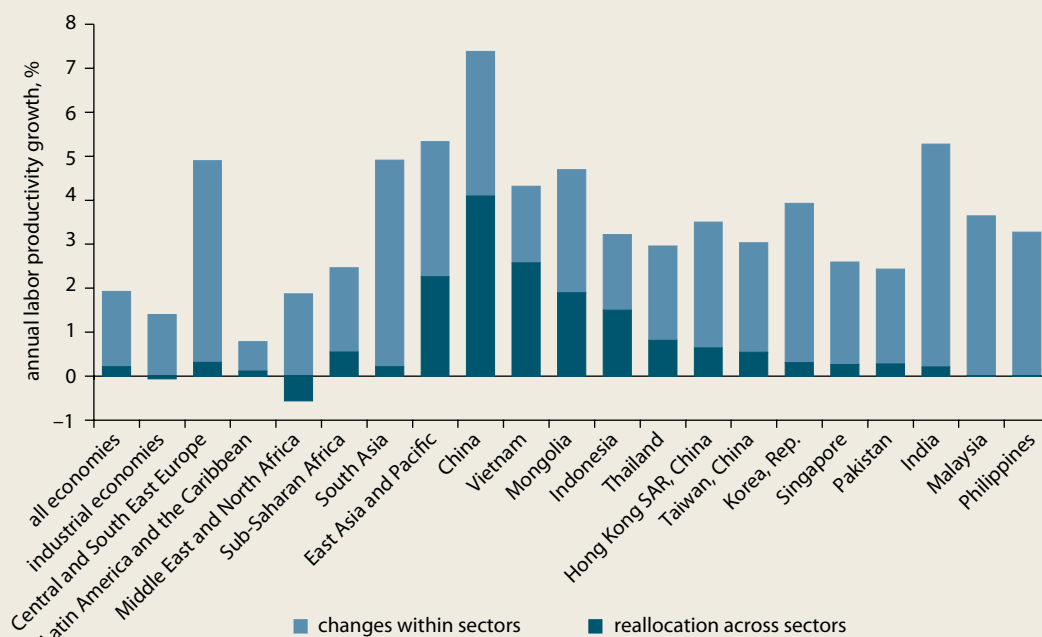
Source: World Development Report 2013 team estimates based on Kucera and Roncolato 2012.

Note: The figure shows the decomposition of labor productivity growth in 81 economies over 1999–2008 into productivity changes due to changes within sectors and reallocation across sectors. Seven sectors are considered: agriculture, hunting, forestry, and fishing; mining and utilities; manufacturing; construction; trade, restaurants, and hotels; transport, storage, and communication; and other services. The regional growth rates are weighted averages, with weights based on an economy's share in regional GDP.

urban centers has continued for a long period of time. Enterprises have been sprawling into the suburbs of urban centers rather than leapfrogging to different locations as in some industrial countries (map 3.1). Similar shifts are happening in Brazil, China, and Vietnam.[7] In India, large manufacturing enterprises are moving away from urban centers into rural locations.[8] Regardless of the nature of the shift, almost inevitably jobs are created in some places and destroyed in others.

Underneath these sectoral and spatial changes in the structure of employment are the firm dynamics connecting job flows and productivity growth. Aggregate productivity grows when existing firms become better at what they do, when more productive firms enter the market, and when less productive ones exit. It also grows when more productive firms become bigger and less productive ones become smaller. Decomposition analyses show that in most countries the main driver of aggregate productivity growth is firms becoming better at what they do (figure 3.4).[9] Entry and exit also contribute, which indicates that new firms are more productive than those exiting. In general, exiting firms see their productivity decline before they close, whereas new firms tend to attain the average levels of productivity of their industry within five years. These complex dynamics imply that at any point in time, firms with very different productivity levels coexist, even within narrowly defined industries.[10]

The popular perception that productivity grows through downsizing at the firm level is partially supported by these analyses. Indeed, in many cases, employment tends to shrink in firms experiencing rapid productivity growth.[11] But downsizing is only part of the story. There are also many successful upsizing firms, achieving both productivity growth and employment growth.[12] For instance, one-fourth of manufac-

MAP 3.1 *Manufacturing activities are sprawling out of the main urban centers in the Republic of Korea*
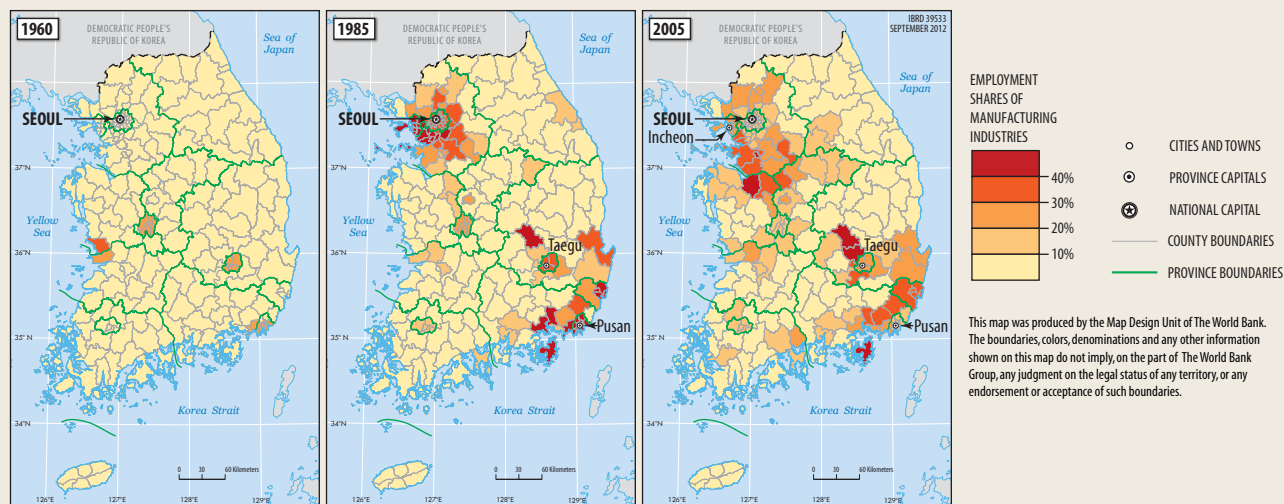
Source: Park et al. 2011.
Note: The maps show employment shares of manufacturing industries at the city or county level for 1960, 1985, and 2005.

FIGURE 3.4 *Efficiency gains at the firm level are the main driver of productivity growth*
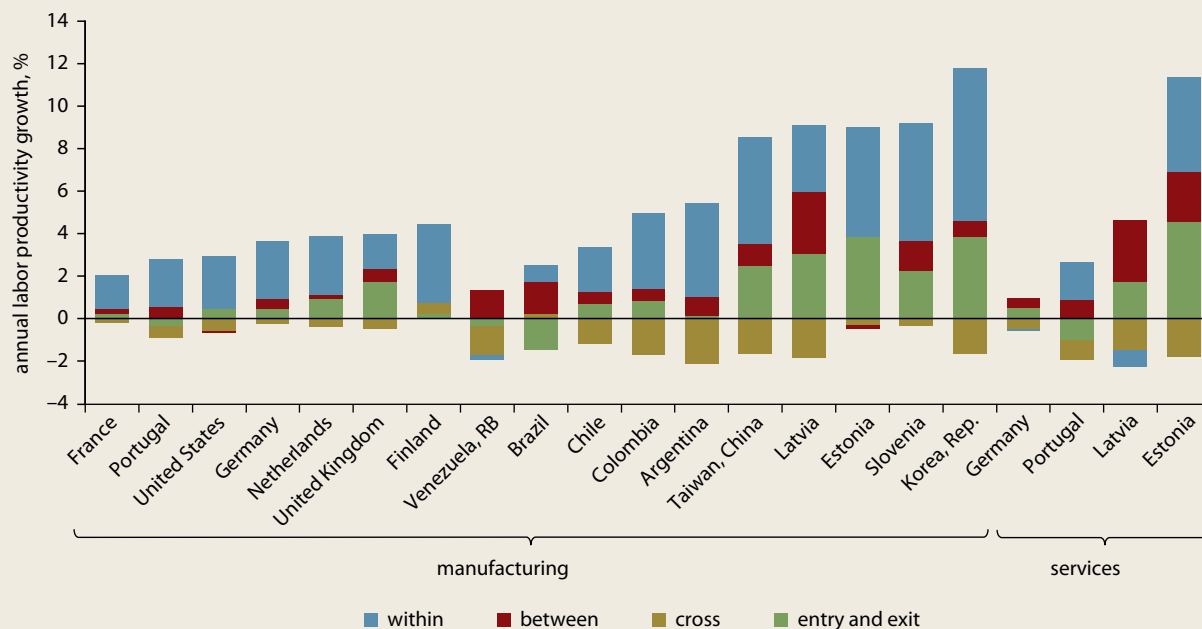
Source: Based on Bartelsman, Haltiwanger, and Scarpetta 2009b.
Note: The figure decomposes annual labor productivity growth. Data for industrial countries are from France (1990–95), the Netherlands (1992–2001), the United States (1992,1997), Portugal (1991–1994), the United Kingdom (2000, 2001), and Germany (2000–02). Data for developing economies are from Argentina (1995–2001); Brazil (2001); Chile (1985–99); Colombia (1987–98); Estonia (2000, 2001); the Republic of Korea (1988, 1993); Slovenia (1997–2001); Taiwan, China (1986, 1991, 1996); and República Bolivariana de Venezuela (1999). *Within* captures the changes at the firm level, *between* the changes in employment shares across firms, *cross* the interaction between the former two, and *entry and exit* the opening and closure of firms.

FIGURE 3.5 *Efficiency gains and employment growth can go together*
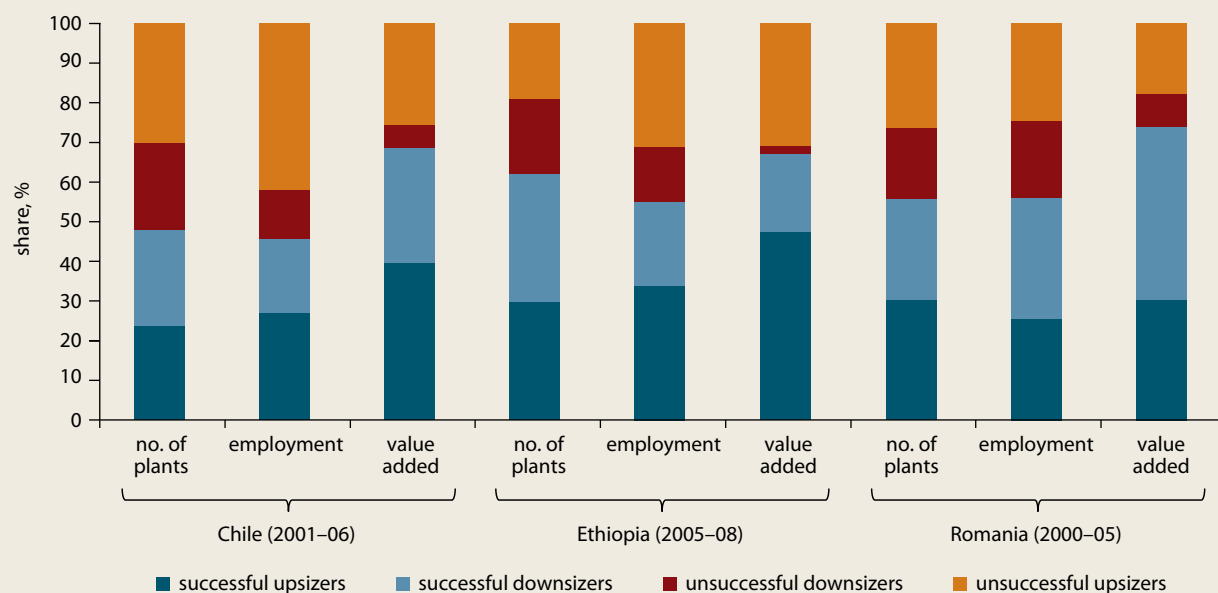
Source: World Development Report 2013 team based on Amadeus Database, Bureau van Dijk, Amsterdam, and Ethiopia Large and Medium Scale Manufacturing and Electricity Industries Survey, Central Statistical Agency, Addis Ababa.
Note: no. = number. The figure shows the contribution of each of the four groups to the annual growth rate of the variable of interest. The plants considered employ at least 10 workers and exist throughout the entire period. Successful upsizers are plants that increased both labor productivity and employment, successful downsizers are plants that increased productivity but reduced employment, unsuccessful downsizers are plants that reduced employment and productivity, and unsuccessful upsizers are plants that increased employment but reduced productivity.

turing plants operating in Chile over 2001–06 were successful downsizers, consistent with the popular perception. But another one-fourth were successful upsizers, achieving both productivity and employment growth (figure 3.5). More important, the successful upsizers contributed more to production, employment, and aggregate productivity growth than the successful downsizers. Results were similar in Romania between 2000 and 2005, and in Ethiopia between 2005 and 2009. While country experiences vary, having a critical mass of successful upsizers is not uncommon.

Across countries, successful upsizers in manufacturing industries tend to be younger, leaner, and more innovative. Among survivors in the same industry and region, younger firms were more likely to be upsizers in Chile over 2001–06, and successful upsizers in Romania over 2000–05. In all three countries, survivors employing fewer than 20 employees tended to upsize fewer rather than downsize. In Romania, survivors investing more in capital per worker also tended to

be successful upsizers.[13] Recent evidence based on 26,000 manufacturers from 71 countries further shows that firms that innovated in products or processes were more likely to be successful upsizers; they not only attained higher total factor productivity than noninnovative firms; they also exhibited higher employment growth.[14]

Transition economies in Europe illustrate the links between job reallocation and productivity growth. Before reforms were implemented, these economies suffered from large distortions caused by a rigid planning system, which prevented resources from flowing to more efficient uses. Liberalization led to massive downsizing and job losses. Eventually, it also strengthened incentives, mobility, and markets, opening up space for more productive private companies. The entry of these dynamic players contributed between 20 and 50 percent of total labor productivity growth in the late 1990s. The exit of obsolete firms released resources that could be used more effectively by new or existing firms. Although lack of experience and small

size often made the new firms less productive than the average firms of more advanced countries, these new firms were more efficient than domestic incumbents. They played a strong role in boosting productivity in medium- and high-technology industries and in exerting competitive pressure on existing firms.[15]

China's rapid productivity growth was also underpinned by large-scale reallocation. Beginning in 1978, economic reform efforts gradually expanded the influence of markets and deepened global integration. All of this created unprecedented opportunities for the formation of private entities, including township and village enterprises, and the entry of foreign companies. During the first decade of reform (1978–88), reallocation from agriculture to nonagriculture activities was the source of almost half of all productivity growth. In the following decades, however, the main drivers of productivity growth were labor reallocation out of the state sector, private sector vibrancy, and state sector restructuring. The scale of business entry was startling: the number of industrial firms rose from 377,000 in 1980 to nearly 8 million in 1996. The 2004 economic census reported 1.33 million manufacturing firms with annual sales above RMB 5 million.[16] Most of them were private. The entry of these new businesses and the closure of nonviable state-owned enterprises (SOEs) accounted for two-thirds of TFP growth in manufacturing sectors over 1998–2006.[17]

Most jobs are in very small farms and firms

Many people in developing countries work in very small and not very dynamic economic units—family farms, microenterprises, and household businesses. Although microenterprises are often defined as firms employing ten or fewer workers, many among them are actually one-person businesses. Given their contribution to total employment, these small economic units cannot be ignored. Understanding their dynamics is crucial to deciphering the relationship between jobs and productivity.

In family farms, hired labor is usually employed in simple tasks such as weeding and harvesting, whereas family labor usually carries out care-intensive activities such as water management, land preparation, and fertilizer application. Limited reliance on hired labor is due to the difficulty to monitor effort, and without machinery, farms cannot be expanded beyond the size manageable by the family's labor, which is typically 1 to 2 hectares.[18] Family farms dominate even in high-income countries, and owner cultivation is the most common form of land tenure, especially in Asia (figure 3.6).

At 1.2 and 1.8 hectares, respectively, average farm size is small in both Asia and Sub-Saharan Africa.[19] In Asia, farmers typically own land plots, which they supplement through tenancy contracts that facilitate transfers from relatively land-abundant to relatively labor-abundant households. Farms in Sub-Saharan Africa are slightly larger than in Asia, but size and the importance of owner farming are becoming similar in both regions.[20] There are some exceptions to this pattern. Colonial governments created large farms in some developing countries, such as estates in southern Africa, haciendas in Latin America and the Philippines, and plantations in the Caribbean. In Sub-Saharan Africa, large areas are also held as customary land—owned collectively by extended families, clans, or lineage.[21]

FIGURE 3.6 *Smallholder farming is dominant outside Latin America*
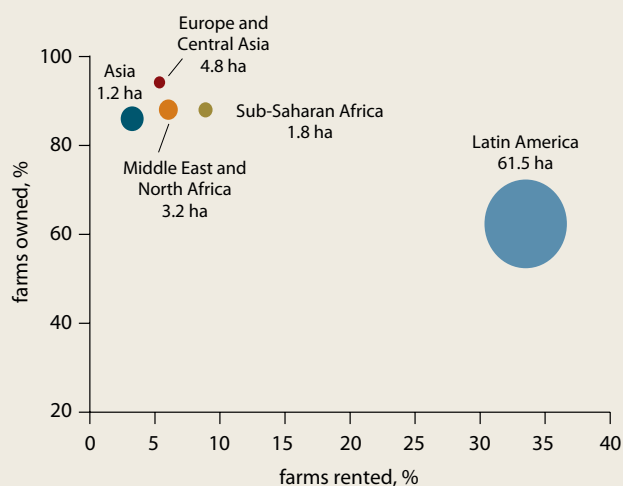
Source: FAO 2010.

Note: ha = hectare. Countries in Asia include: Bangladesh, India, Indonesia, the Lao People's Democratic Republic, Nepal, Pakistan, and Thailand; in Europe and Central Asia: Azerbaijan, Croatia, the Czech Republic, Georgia, the Kyrgyz Republic, Latvia, Serbia, Slovenia, and Turkey; in Latin America and the Caribbean: Brazil, Guatemala, Nicaragua, St. Lucia, St. Vincent and the Grenadines, Uruguay, República Bolivariana de Venezuela, and Virgin Islands (United States); in the Middle East and North Africa: the Arab Republic of Egypt, Jordan, Morocco, Qatar, Saudi Arabia, and Tunisia; and in Sub-Saharan Africa: Côte d'Ivoire, Ethiopia, and Madagascar.

FIGURE 3.7 *The employment share of microenterprises is greater in developing countries*
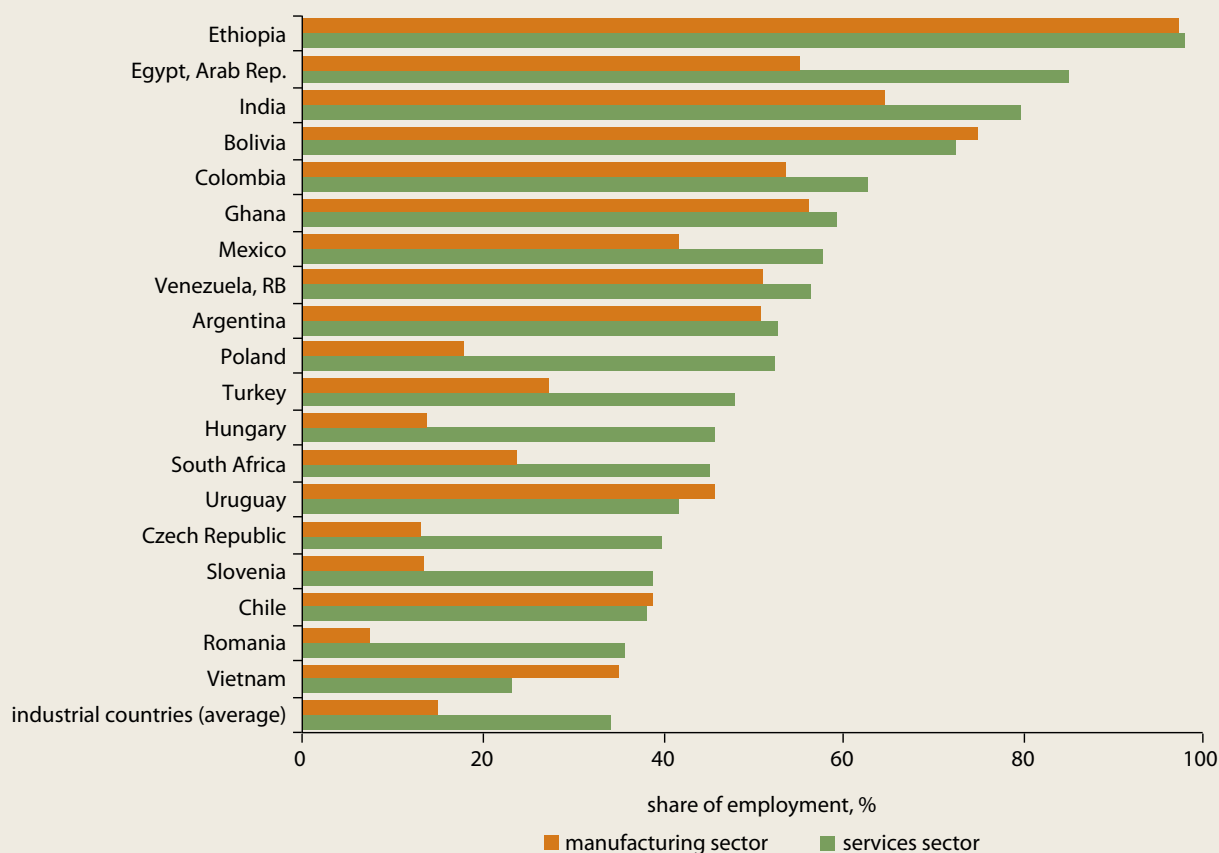
Sources: World Development Report 2013 team estimates based on International Income Distribution Database (I2D2) and EUROSTAT.
Note: Microenterprises are firms, formal or informal, with fewer than 10 workers. Data for developing countries are from Argentina (2006–10); Bolivia (2005, 2007); Chile (2006, 2009); Colombia (2009); the Czech Republic (2005–07); the Arab Republic of Egypt (2006); Ethiopia (1999); Ghana (1991); Hungary (2007–08); India (2004, 2009); Mexico (2004–10); Poland (2005–07); Romania (2005–07); Slovenia (2005–07); South Africa (2005–07); Turkey (2006–10); Uruguay (2009); República Bolivariana de Venezuela (2004–06); and Vietnam (2009). Data for industrial countries are from Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, and the United Kingdom over 2005–07.

Outside of agriculture, microenterprises and household businesses are dominant. More than 80 percent of registered manufacturing establishments in Argentina, Bolivia, El Salvador, and Mexico have fewer than 10 workers.[22] About 90 percent of manufacturing establishments employ 5 to 49 workers in China; India; Indonesia; Korea; the Philippines; and Taiwan, China.[23] The share of microenterprises is even higher outside manufacturing, reaching 94 percent in the services sector of Mexico and 98 percent in all modern sectors in Tunisia.[24] In several African and Latin American countries, the majority of informal enterprises consist of 1- to 3-person businesses.[25]

It is often claimed that most employment, and most job creation, is associated with small and medium enterprises, but that is generally not true in developing countries. In reality, micro- and small enterprises account for the bulk of employment, even in middle-income countries (figure 3.7). Their share is often underestimated, because economic censuses and plant-level surveys rarely cover the informal segment of the economy, where businesses are especially small. But data from household and labor force surveys that are representative of the entire population provide a different picture. These small enterprises play significant role in employment in manufacturing. They account for 97 percent of employment

BOX 3.2   *Microenterprises account for most job creation and destruction*

In some household and labor force surveys, employees are asked to report the size of the firm they work for, or the size of their own business if they are self-employed. This information can be used to estimate the distribution of employment by plant size. This distribution can in turn be used to correct for the omission of informal enterprises in an economic census or plant-level survey.

This approach was applied to Chile's manufacturing survey, the Annual National Industrial Survey (Encuesta Nacional Industrial Anual), which covers more than 90 percent of employment among establishments with 50 workers or more, but less than half the employment in establishments with 10 to 49 workers. Nearly 300,000 workers in microenterprises are omitted from the survey; 250,000 of them work in firms with fewer than 5 employees.

The distribution of job flows by firm size that emerges from the manufacturing survey can be adjusted based on the distribution of employment by plant size from Chile's household survey, the National Socioeconomic Characterization Survey (Encuesta de Caracterización Socioeconómica Nacional, or CASEN). Before this adjustment, larger firms seem to account for most job creation and destruction. But the adjustment shows that microenterprises contribute about 80 percent of gross job flows. This estimate should not be taken literally, because the microenterprises for which information on job creation and destruction is available are not necessarily representative—the Chilean census started to include microenterprises only in the late 1990s. But even with a margin of error, the estimate is so large that it changes the picture of job creation and job destruction.

a. Contribution by firm size before correcting, 2000–06

b. Contribution by firm size after correcting, 2000–06

■ shares in job creation, %   ■ shares in job destruction, %
■ shares in employment, %
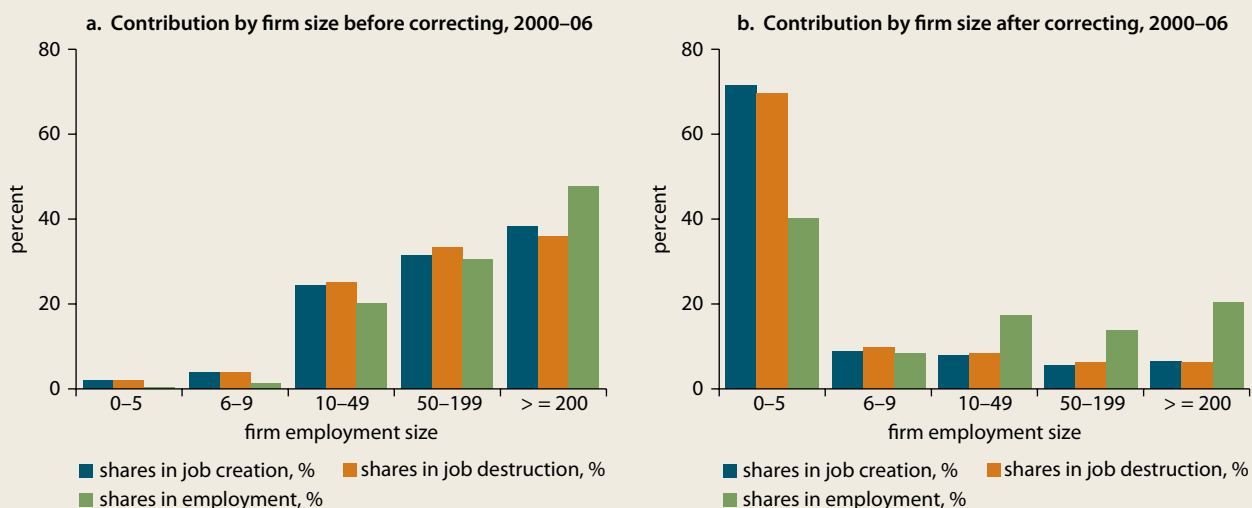
Source: World Development Report 2013 team.

in the manufacturing sector in Ethiopia and 39 percent in Chile. In services sectors, their role is often more important. Even in Eastern European countries, 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. Micro- and small enterprises also play a critical role in job creation and destruction (box 3.2).[26]

In farms, uneven technological progress

It is generally assumed that large farms are more productive. In low-income countries, however, yields per hectare tend to be higher in smaller farms, because family farms apply more labor per unit of land, even though they apply fewer purchased inputs. This inverse relationship between farm size and productivity was first observed in South Asia.[27] But it has also emerged in Sub-Saharan Africa as population pressure on the land has led to agricultural intensification. In Kenya, Malawi, Tanzania, and Uganda, a 1 percent increase in farm size is associated with a 0.1 to 0.2 percent reduction in yield.[28] The use of family labor per hectare is also inversely correlated with farm size.[29]

The relationship between crop yields and farm size emerges, because the larger, more mechanized farms have higher productivity. But

FIGURE 3.8 *Crop yields have diverged vastly across regions*
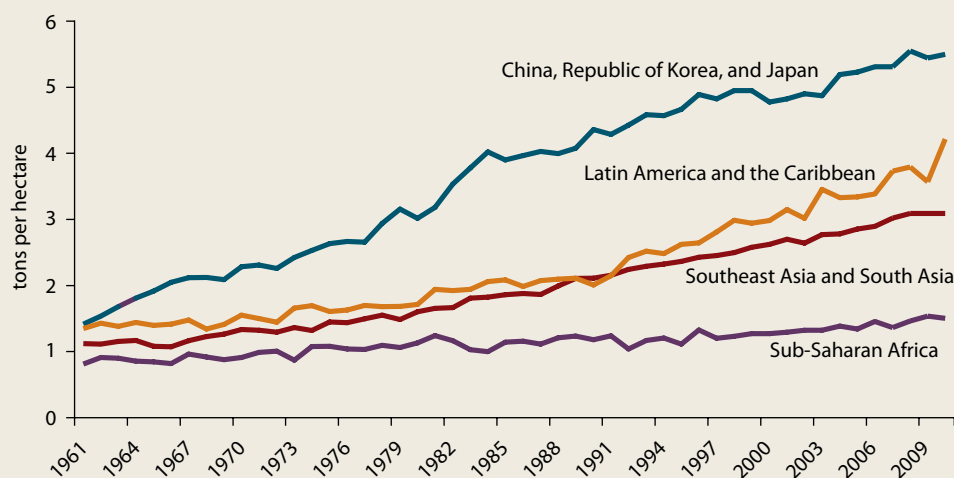
Source: FAOSTAT-Agriculture (database), Food and Agriculture Organization, Rome.
Note: Figures are weighted averages of yields for wheat, rice, and coarse crops.

constraints in land markets usually slow expansion and mechanization.[30]

The new technologies of the Green Revolution contributed to job creation because they were labor intensive. Short-statured, fertilizer-responsive, high-yielding varieties of rice and wheat were developed by international agricultural research centers in the late 1960s. The varietal improvement of other cereals such as maize followed. These varieties, as well as improved production practices, were quickly diffused, particularly in tropical Asia. The amount of inorganic fertilizer applied has steadily increased over extended periods.[31] Thanks to continual technological improvements and sustained adoption, cereal yields have increased dramatically for the past several decades.[32]

Progress has been uneven across regions, however (figure 3.8). In Sub-Saharan Africa, there is no evidence to suggest that small farmers were slower than larger farmers in adopting the new technologies. But the Green Revolution has not taken place on a large scale, even though farmland has been growing scarce because of population pressure on limited cultivable areas.[33] Feeding growing populations from a shrinking amount of farm land requires Sub-Saharan African countries to increase cereal yields.[34] Yet improved agricultural technology is location specific: improved varieties in Asia may not be productive in Sub-Saharan Africa, and high-yielding varieties in irrigated areas may be low-yielding in rain-fed areas.[35]

The agricultural growth associated with the Green Revolution not only creates jobs in farming but also facilitates the development of the nonfarm sectors.[36] The adoption of modern technology stimulates the production and marketing of fertilizer and other purchased inputs. Increased supply of cereals stimulates the development of food markets and keeps the cost of living low for those who migrate to the cities. In addition to these backward and forward links, the increase in farmers' incomes heightens the demand for goods and services.[37] Cross-country analyses show that agricultural growth has resulted in the expansion of nonfarm sectors, particularly where the agricultural sector is large.[38]

Among firms, much churning and few gazelles

Outside of agriculture, productivity varies substantially across enterprises, implying that job reallocation could lead to large gains in aggregate productivity. In India, within a narrowly defined manufacturing industry, a plant at the 90th percentile of the TFP distribution gener-

FIGURE 3.9 *The dispersion of productivity in manufacturing is greater in developing countries*

productivity ratio between 90th percentile and 10th percentile of TFP distribution
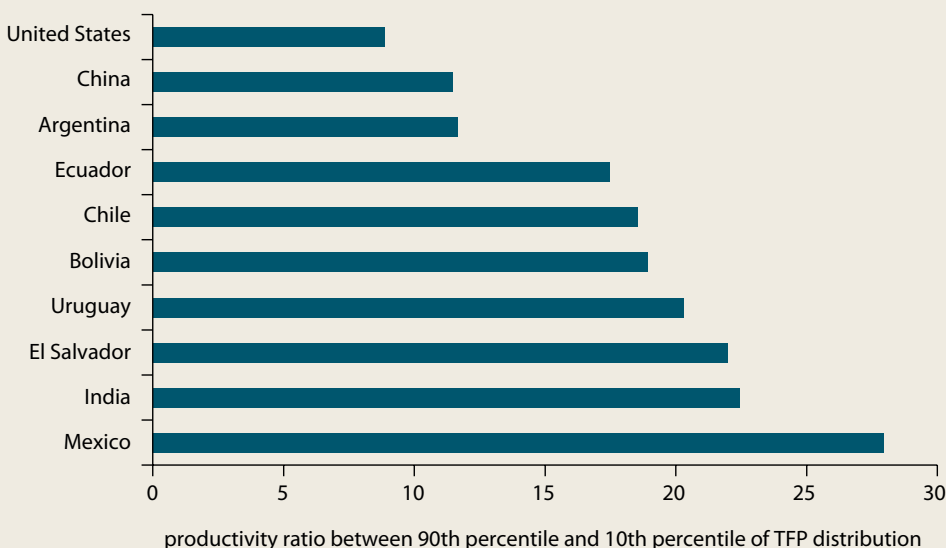
Source: Pagés 2010.
Note: TFP = total factor productivity. The figure shows the ratio of TFP among plants between the 90th and the 10th percentiles of the TFP distribution within narrowly defined industries. TFP is measured as physical productivity, as defined by Foster, Haltiwanger, and Syverson (2008). The data cover only the manufacturing sector. Data are from Argentina (2002), Bolivia (2001), Chile (2006), China (2005), Ecuador (2005), El Salvador (2005), India (1994), Mexico (2004), United States (1997), and Uruguay (2005).

ates 22 times as much output as a plant at the 10th percentile. In comparison, the estimated ratio is only 9 to 1 in the United States.[39] The dispersion of TFP is also high in a number of Latin American countries (figure 3.9). Detailed data on nonmanufacturing firms are scarcer. But the dispersion of TFP in retail businesses in Mexico, and in communication and transportation businesses in Uruguay, is also sizable.[40]

The speed at which productivity grows also varies across firms. Large firms are typically more innovative than small firms. They tend to invest more in machinery and hire more educated workers. They are also more likely than small firms to engage in activities such as developing new product lines, introducing new technology, opening and closing plants, outsourcing, and engaging in joint ventures with foreign partners (figure 3.10a). Large firms produce more with a given amount of labor, are more likely to export, and tend to export more. They also pay substantively higher wages than micro- and small enterprises (figure 3.10b). They pay a wage premium even controlling for age, education, and other worker characteristics. Not all large firms are innovative, however. When size is supported through nonmarket mechanisms,

efficiency tends to suffer. Large SOEs without foreign competitors are less innovative and productive than other large firms.[41]

For a given size, young firms are also more likely than old firms to engage in innovative activities. They also have better growth prospects, a finding consistent with evidence from industrial countries (figure 3.11).[42] For example, in the 1990s, when China was in the early stages of reform, human and financial resources were concentrated in SOEs. However, the incentive structure in these enterprises hindered innovation. In contrast, the new township and village enterprises lacked the resources to adopt new technology and import new equipment, but they were more flexible in their decision making. As a result, these younger firms were more dynamic than large SOEs, although they were less productive than large and medium private companies.[43]

In developing countries, the dispersion of productivity and growth prospects across firms is further widened by the large number of microenterprises, many of which are barely more than a means of subsistence for the poor. A majority of these microenterprises have limited capital and often even lack a fixed address.

FIGURE 3.10 *Large firms tend to perform better and to pay better than small ones*
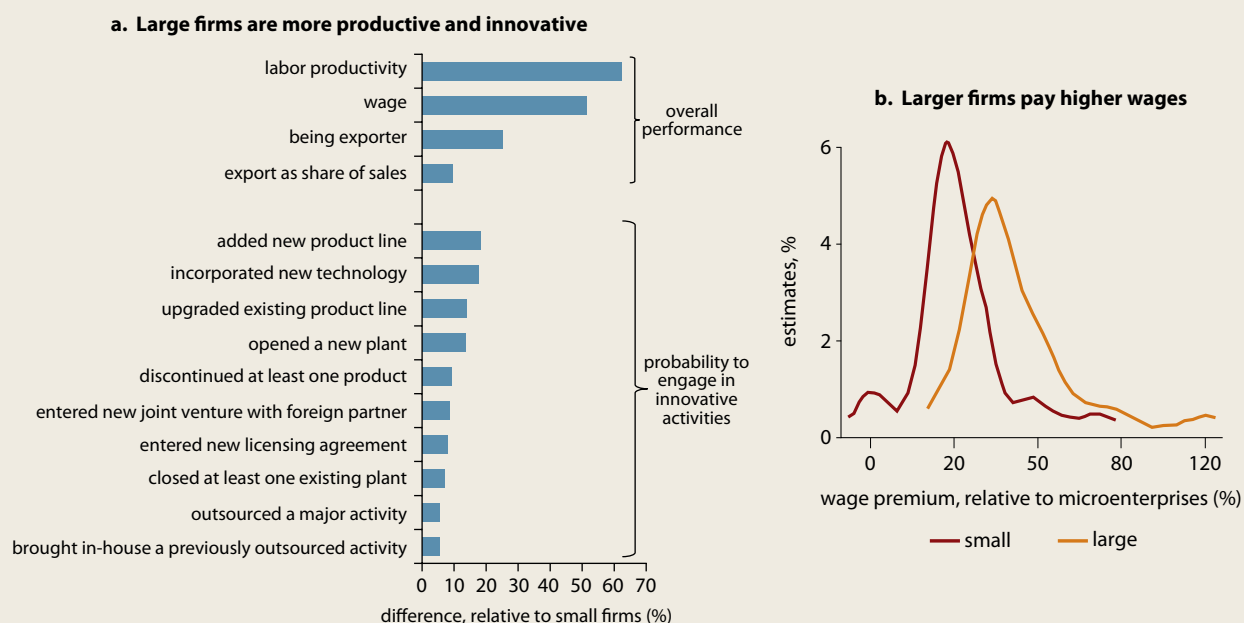
a. Large firms are more productive and innovative

b. Larger firms pay higher wages

Source: World Development Report 2013 team based on Ayyagari, Demirgüç-Kunt, and Maksimovic 2011a; and Montenegro and Patrinos 2012 for the World Development Report 2013.

Note: Panel a uses World Bank enterprise surveys covering more than 54,000 firms across 102 developing countries over 2006–10 for overall performance, and 19,000 firms across 47 developing countries over 2002–05 for innovative activities. The analysis controls for firm characteristics, industry, and country. In this panel, large firms employ 100 or more workers and small firms fewer than 20 workers. Panel b uses 138 household and labor force surveys spanning 33 countries over 1991–2010 and controls for worker characteristics. In this panel, large firms are those employing more than 50 workers and small firms 10 to 50 workers.

FIGURE 3.11 *Young firms are more likely than old ones to engage in innovative activities*
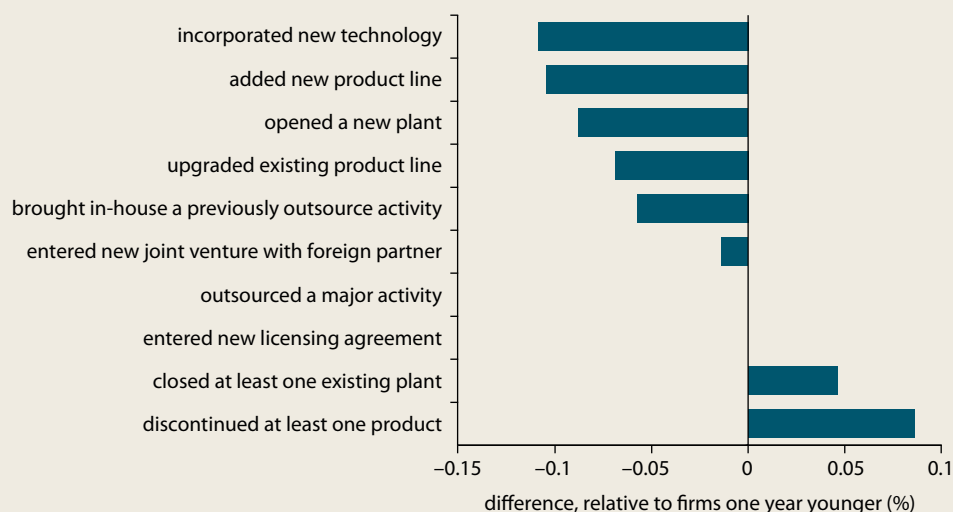
Source: World Development Report 2013 team based on Ayyagari, Demirgüç-Kunt, and Maksimovic 2011a.

Note: The figure uses World Bank enterprise surveys covering 19,000 firms across 47 developing countries over 2002–05, controlling for firm characteristics, industry, and country. Statistically insignificant estimates are reported as zeroes.

BOX 3.3 *Most microenterprises are in rural areas and engage in commerce*

Microenterprises in urban areas, and particularly those in the informal sector, tend to attract the attention of academics and policy makers. But microenterprises are prominent in rural areas as well. The surveys of micro- and small enterprises in Africa and in Latin America and the Caribbean show that fewer than half are in cities and towns with 20,000 inhabitants or more. The urban share reaches 46 percent in the Dominican Republic but is below 30 percent in all other countries surveyed. Even if rural towns are counted (generally, localities with 2,000 to 20,000 inhabitants), well over half of the enterprises are in strictly rural areas in most countries.

The vast majority of microenterprises are engaged in commerce, supporting the conventional view that associates microenterprises with street vendors and petty traders. But a significant number are involved in light manufacturing activities. According to the 1-2-3 surveys of West African countries, the most important sector in capital cities is petty trading (27.1 percent of all enterprises), followed by

other manufacturing and food (16 percent) and other services (11.8 percent). Similarly, the surveys of countries in Africa and in Latin America and the Caribbean suggest that 56 to 74 percent of micro- and small firms in urban areas, and 60 to 70 percent in rural areas, are engaged in commerce. The surveys of household enterprises in Sub-Saharan African countries show similar patterns. These surveys identify three manufacturing activities as the most important across all countries: textiles and apparel, food and beverages, and wood and forest products. These three categories account for about 75 percent of manufacturing enterprises in urban areas and nearly 90 percent of manufacturing enterprises in rural areas.

Most of the microenterprises operate from home or on the street. According to the surveys of household enterprises in Sub-Saharan Africa, 25 to 45 percent of these microfirms use home as primary point of operation, and 10 to 40 percent of them simply work on the street.

Sources: Fox and Sohnesen 2012; Grimm, Kruger, and Lay 2011; Liedholm 2002.

Many are located in rural areas, absorbing some labor slack during the low agricultural season (box 3.3). Across 18 developing countries, 44 percent of the people living on less than US$1 a day in urban areas, and 24 percent of those in rural areas, work in a nonagricultural business. On average, they do not earn much.[44]
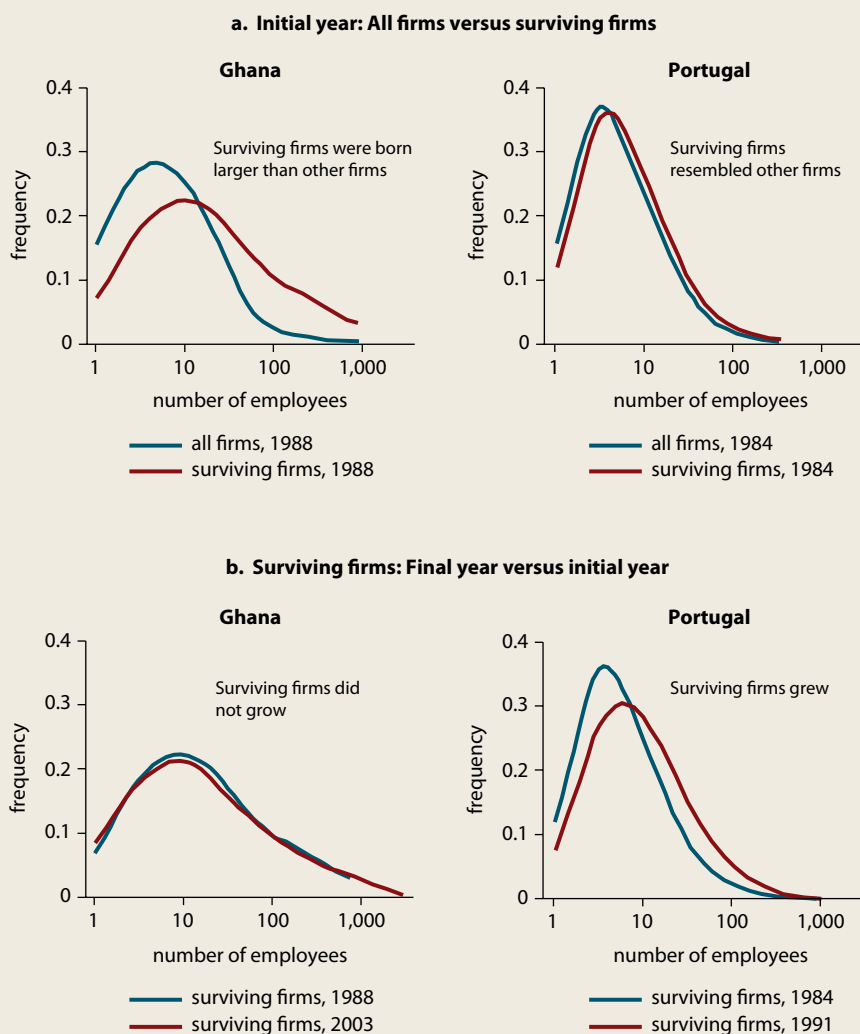
Nonetheless, these nonfarm activities provide an important channel to diversify income for the poor. In nine Sub-Saharan African countries, most nonfarm jobs were generated by households starting businesses, rather than entering the rapidly expanding private wage sector. Despite being modest, earnings from household enterprises contribute to consumption much the same as earnings from wage employment do. And these small businesses offer an avenue for poor households to engage in gradually more productive activities.[45]

While microenterprises have a lackluster performance as a group, they are also very diverse. In middle-income countries, a significant share of the owners of micro- and small enterprises are as entrepreneurial as their peers in industrial countries. Their weak performance may be driven more by contextual factors such as limited access to credit and policy-induced barriers to access technologies and markets, than by limited capacity. In several Latin American countries, for example, entrants into self-employment tend to be workers who have ac-

cumulated human and physical capital while working for a wage or a salary. Operating microenterprises is a choice for them. Those who achieve higher productivity levels are more likely to stay in business, grow, and create job opportunities for others.[46]

A very small group of microenterprises actually displays a strong performance. This group bears similarities with the so-called "gazelles" of industrial countries—high-growth companies whose revenues increase by at least 20 percent annually for four years or more. In industrial countries, the term "gazelle" is used for companies starting from a revenue base of at least US$1 million, which makes them very big by developing-country standards. Nonetheless, the same dynamism can be found at a much smaller scale. Data from seven Sub-Saharan African countries show that the median capital stock held by urban informal enterprises is less than US$80, whereas the capital stock for those in the top quintile averages US$5,000. The average monthly profit of those in the top quintile is seven times the median monthly profit. The rate of returns to capital is also relatively high in these firms.[47] This heterogeneity among microenterprises suggests they can be an incubator for large and productive firms.

The dynamism of microenterprises matters not only for livelihoods but also for productivity growth. Large firms innovate more, but they are

FIGURE 3.12 *Surviving firms were born larger and grew less in Ghana than in Portugal*

a. Initial year: All firms versus surviving firms

Ghana

Portugal

Surviving firms were born larger than other firms

Surviving firms resembled other firms

— all firms, 1988
— surviving firms, 1988

— all firms, 1984
— surviving firms, 1984

b. Surviving firms: Final year versus initial year

Ghana

Portugal

Surviving firms did not grow

Surviving firms grew

— surviving firms, 1988
— surviving firms, 2003

— surviving firms, 1984
— surviving firms, 1991

Sources: Cabral and Mata 2003; Sandefur 2010.

not all born large. In industrial countries, some of the more resounding successes, from Honda to Microsoft, started in garages. And many successful companies in developing countries also grew out of small household businesses. Thailand's Charoen Pokphand Group, founded in 1921 as a small seed shop in Bangkok by two brothers, has grown into one of the world's largest multinational conglomerates in agribusiness, operating in 15 countries and encompassing close to 100 companies.[48] India's Tata Group transformed from a Mumbai-based, family-owned trading firm in the late 19th century to

a multinational conglomerate comprising 114 companies and subsidiaries across 8 business sectors on several continents.[49] Many of China's successful clusters, such as the footwear and electric appliance industry in Wenzhou, also started from small family businesses working close to each other.[50]

A vibrant firm life cycle is often missing, however. Larger and older firms tend to be stagnant, while smaller enterprises are prone to churning. In Ghana, for example, many firms are born large and show little growth over 15 years (figure 3.12). In Portugal, by contrast,

FIGURE 3.13 *The majority of firms grew little in India and Mexico*

a. Employment over a firm's life cycle

b. Productivity over a firm's life cycle

India   Mexico   United States
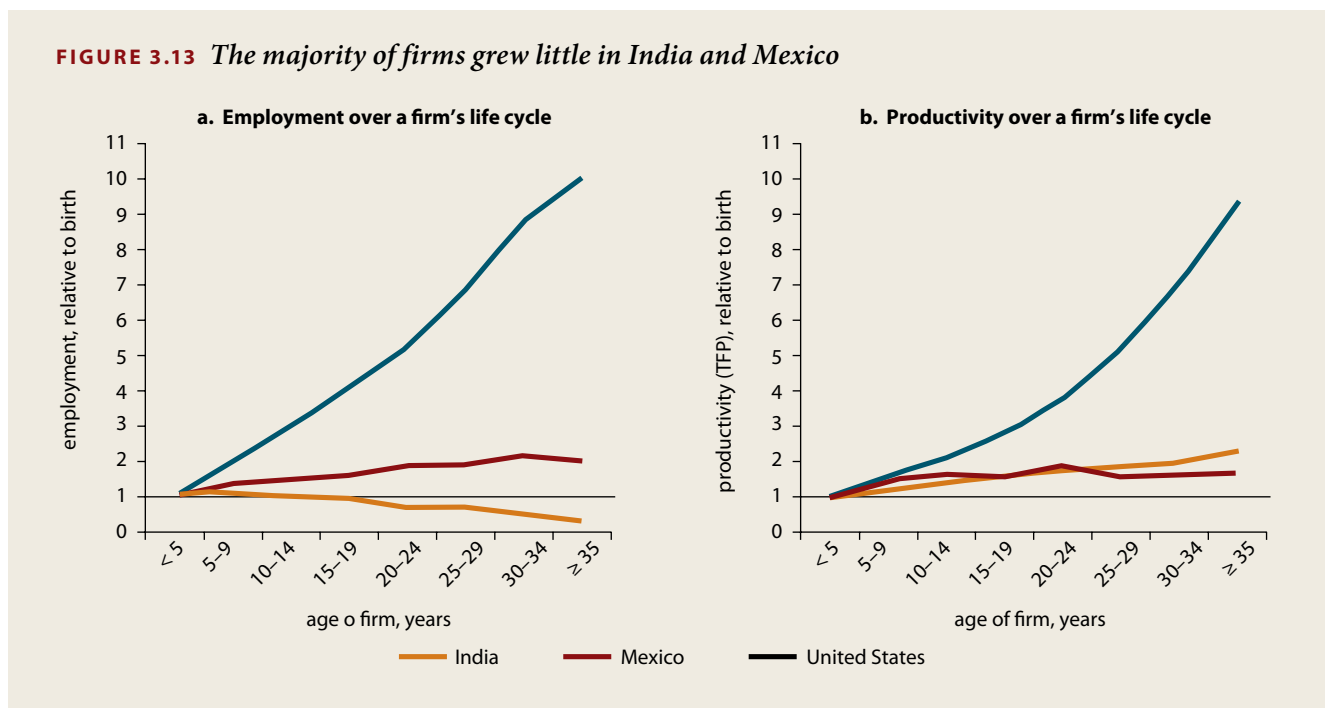
Source: Hsieh and Klenow 2011.
Note: TFP = total factor productivity. Figures show the average employment (or productivity) of firms in different age groups relative to the average employment (or productivity) of those same firms had at birth. Figures are computed using 1989–90 and 1994–95 data for India, 1998 and 2003 data for Mexico, and 1992 and 1997 data for the United States.

many more firms are born as microenterprises and grow substantially in 7 years.[51] The majority of firms are born small in India too, but they tend to stay small, without displaying much variation in employment over their life cycle. A revealing comparison involves the size of 35-year old firms relative to their size at birth. In India, the size declines by a fourth. In Mexico, it doubles. In the United States, it is 10 times larger (figure 3.13a). Productivity growth over a firm's life cycle follows similar patterns in these countries (figure 3.13b).[52]

Churning—entering and exiting at a relatively high rate—is much more common than growth among the micro- and small enterprises of developing countries. In several Sub-Saharan African and Latin American countries, about 20 percent of micro- and small enterprises enter and leave the market in the same year. A majority of closures occur within three years of starting up. Among the survivors, less than 3 percent expand by four employees or more.[53] In Vietnam,

20 to 30 percent of household enterprises leave the market over a two-year period, while the total number of household enterprises remains about the same.[54] In Sub-Saharan Africa, few household enterprises expand into employment beyond the household, as shown by the experiences of Ethiopia, Tanzania, and Madagascar.[55] In Mexico, individuals starting microenterprises are more likely to remain the sole worker than to increase the firm size (table 3.1).[56]

The wide dispersion of productivity among businesses, the large number of unsustainable microenterprises, and the stagnation of larger firms all suggest that the process of market selection and creative destruction that has underpinned the rapid growth of transition economies and East Asian countries in the past decades is weak in most developing countries. This weakness impedes labor and other resources from moving toward their most productive uses and undermines both job creation and productivity growth. Gains from tackling the difficulties faced

TABLE 3.1 *Few small firms grew in Mexico*

		Same firms by size in 2011, %			
		Own account	1–4 workers	5–9 workers	10 or more workers
Firms by size in 1987, %	Own account	51.9	12.4	0.5	0.2
	1–4 workers	22.1	49.2	3.9	1.5
	5–9 workers	7.8	35.1	22.6	13.1
	10 or more workers	4.1	15.2	14.4	44.6

Source: Fajnzylber, Maloney, and Rojas 2006.
Note: Rows do not add up to 100 percent because the owners of some of these firms may become salary workers or unemployed.

by the start-ups and removing constraints to the growth of incumbents could be sizable, but the task is daunting (question 3).[57]

* * *

Jobs can have an impact on the productivity of others, beyond the jobholder and the economic unit where they belong. Jobs that have these additional impacts do more (or less) for development. These additional impacts arise because jobs differ in the way they connect with each other, and some of the connections do not occur through markets. In functional cities, ideas are exchanged among people more effectively, making everybody more productive. In clusters, similar firms that locate next to each other tend to benefit from a broader pool of qualified workers and common support services. Firms also connect with foreign businesses through trade and investment, and, in integrating with global value chains, they can acquire more advanced knowledge, technology, and management know-how. In all these ways, specific jobs can contribute to productivity gains of others and elsewhere in the economy. But effects can be negative as well if jobs overuse natural resources or damage the environment, thus reducing aggregate productivity.

Can entrepreneurship be fostered?

Self-employment is prevalent in developing countries, and micro- and small enterprises are a major source of livelihood for low-skilled workers. Even if only a small fraction of these tiny economic units succeeded in building a viable business, with the potential to hire others, the aggregate effect on living standards would be substantial. Their success would also matter for productivity reasons. Quite a few currently large enterprises in industrial countries started out as micro- and small family businesses. By contrast, in developing countries many large enterprises are born large, often the result of government support or privileged access to finance and information. Breaking privileges is one more reason why the success of microenterprises is so important.

Views differ on whether there is scope to help the self-employed succeed. At one time almost every self-employed person or owner of a microenterprise was seen as a potential entrepreneur, held back only by regulatory zeal and corruption. Substantial rates of return on capital for micro- and small enterprises were viewed as evidence of a potential to thrive.[58] But the pendulum has swung, and the conventional wisdom is now rather pessimistic. The large numbers of unregistered self-employed in developing countries are viewed as subsistence entrepreneurs who are trying to make ends meet, not thriving.[59] Evidence on the growth of micro- and small enterprises in several countries in Latin America and West Africa shows that most microenterprises with at least two years of operations remain at their start-up employment levels.[60] Embedded in the pessimism of the conventional wisdom is the idea that entrepreneurial ability and skills cannot be easily transferred, especially not to adults with limited formal education. In this view, entrepreneurs are born, not made. If this view is correct, attempts to convert survivorship into entrepreneurship are bound to fail. The wide dispersion of productivity across firms, including across microenterprises, suggests, however, that reality is somewhere in between the optimistic and the pessimistic view: survivor-
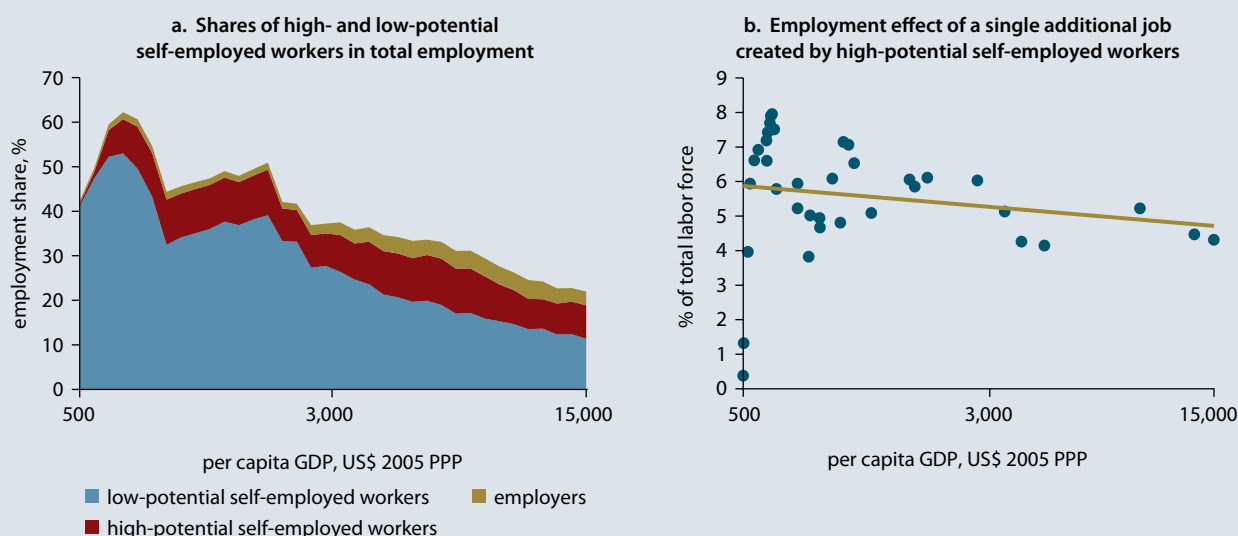
ship may be dominant, but entrepreneurship is unlikely to be missing altogether.

Who is an entrepreneur?

Entrepreneurship combines innovative capacity to put new ideas into effect with managerial capacity to increase a firm's efficiency within the limits of known technology. Specific psychological traits are associated with entrepreneurship, such as a personal need for achievement, a belief in the effect of personal effort on outcomes, self-confidence, and a positive attitude toward risk. These traits are difficult to observe or measure. But surveys comparing entrepreneurs with other workers in places as diverse as China and the Russian Federation show that observable individual characteristics such as education, experience, gender, location, and age are good predictors of entrepreneurship.[61] Among microenterprises, rates of return on capital tend to be higher when their owners are more educated and experienced.

Observable characteristics of the self-employed can thus be used to identify individuals who have potential to become successful entrepreneurs.[62] To illustrate the point, a successful entrepreneur is defined as someone who employs others and is not living in poverty. The share of this group in total employment is small and relatively stable across countries at different levels of development.[63] The share of self-employed workers without paid employees, on the other hand, initially increases and then declines with GDP per capita (figure 3.14a). At its peak, which corresponds to low-income countries, the share of self-employed workers without paid employees reaches almost three-fifths of total employment. Among this group, a majority are individuals with relatively low potential to succeed. Their characteristics are closer to those of wage workers than of employers.[64]

However, if each of the self-employed workers with high potential were to create a single additional job, total employment would increase substantially, somewhat more so in low-income countries (figure 3.14b). As a share of the work-

FIGURE 3.14 *Some among the self-employed have the potential to become successful entrepreneurs*

a. **Shares of high- and low-potential self-employed workers in total employment**

b. **Employment effect of a single additional job created by high-potential self-employed workers**

■ low-potential self-employed workers   ■ employers
■ high-potential self-employed workers

Sources: Gindling and Newhouse 2012 for the World Development Report 2013; World Development Report 2013 team estimates based on data from 36 countries.
Note: GDP = gross domestic product. PPP = purchasing power parity. In panel b, each dot represents a country.

ing age population, such additional job creation would amount to 8 percent in Kenya, 5 percent in the Arab Republic of Egypt and 4 percent in Costa Rica.

While this calculation is hypothetical, several studies report that observable characteristics of micro- and small informal enterprise owners, such as education and gender, are important determinants of innovation and employment growth.[65] In Mexico, after a business registration reform, informal enterprise owners with observable traits similar to those found among formal enterprise owners were more likely to register their business than those similar to wage workers.[66]

What constrains entrepreneurship?

Even potentially skilled entrepreneurs would have difficulty succeeding without access to basic infrastructure and financial resources. In their absence, managerial capacity alone may not be enough to realize productivity gains and employment expansion. The investment climate matters for business performance as well.

Removing obstacles to firm growth is thus a prerequisite to foster entrepreneurship.

Obstacles notwithstanding, entrepreneurial capacity varies substantially across microenterprises and small firms. A distinction is often made between innovative or transformative entrepreneurs and replicative or subsistence entrepreneurs.[67] The former correspond to Schumpeterian type of entrepreneurs, while the latter, who generally manage micro- and small enterprises, are followers. Such a distinction, however, does not capture the broader gradation of managerial performance that lies between the transformative and subsistence extremes. A study of the number of management practices adopted by the owners of micro- and small enterprises in Sub-Saharan Africa reveals a large variation of management scores (figure 3.15). These scores are closely associated with business performance.[68] A broad dispersion of management scores is also found among relatively larger firms in India.[69]

An emerging literature confirms the importance of management practices in explaining firm productivity. Although much of the focus is on large firms, recent studies have turned their

FIGURE 3.15 *Management scores vary widely across small enterprises in Sub-Saharan Africa*
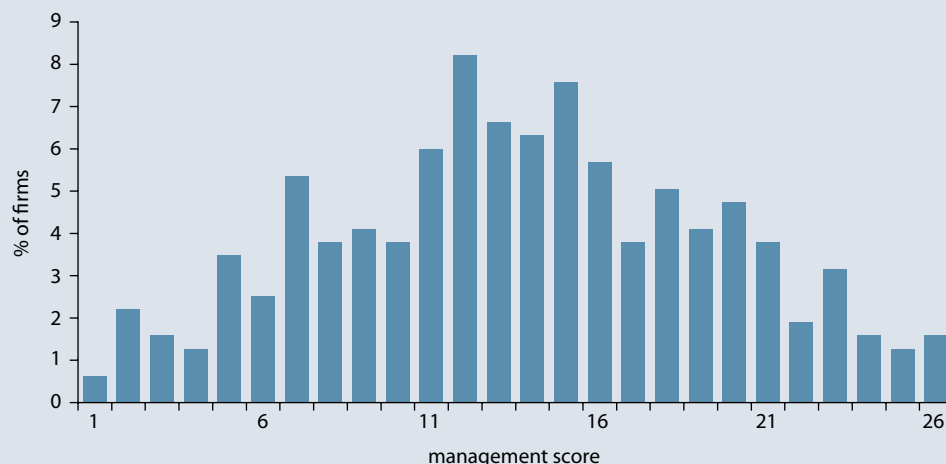
Source: Fafchamps and Woodruff 2012.
Note: The management score measures the degree to which firm owners use and master core management and business techniques. Scores are based on an evaluation of 26 techniques (26 is the highest possible score).

attention to how innovation in small and medium firms takes place. The most telling studies involve management training provided for free to randomly selected firms whose performance is then compared to that of a control group of firms. Evaluations of these programs find that the training improves the financial literacy and basic management skills of business owners. The estimated impact is also positive, but less robust, when it comes to improved business outcomes and job creation. Better outcomes are associated with business owners who already had an initial understanding of the concepts and relatively better access to financial resources.

On the other hand, similarly designed interventions to provide financial resources to microenterprises, or to process their registration with authorities, or to pay the salary of an additional employee, show mixed impacts on business performance.[70] In Mexico and Sri Lanka, grants given to microenterprises increase the income of their owners—and then only if they are male—but do not result in employment creation. In Ghana, similar grants given to female business owners do not result in significant growth of their microenterprises. In Sri Lanka, only 22 percent of eligible microenterprises took

up an offer of a wage subsidy covering 50 percent of the cost of hiring a worker for six months and 25 percent of the cost for another two months. Overall, these results suggest that lack of access to finance is not the only constraint.

Entrepreneurial skills, measured by the education of business owners and their participation in training, explain a large share of the differences in productivity across firms and regions in developing countries.[71] Yet markets fail to nurture entrepreneurship, because knowledge spillovers imply that some of the returns to acquiring or developing new managerial ideas are appropriated by others. More important perhaps, entrepreneurs themselves do not recognize the relevance of management expertise.[72] Only 3 percent of Brazil's owners of micro- and small enterprises, for instance, see management as a binding business constraint.[73] This may be an area where information and knowledge failures matter, leading to a vicious circle of low productivity, low living standards, and insufficient job creation.

The capacity to acquire skills and to apply them to business seems to be one of the most important characteristics of successful entrepreneurs. Success also depends on having core skills

such as numeracy and literacy, as well as social skills. A vast literature highlights the importance of entrepreneurs' schooling as a determinant of firm growth, employment, and efficiency.[74] Russian and Chinese business owners have more entrepreneurs in their families and among childhood friends than otherwise similar individuals, suggesting that social environment also matters.[75]

Learning can also happen through jobs. Nearly half of entrepreneurs managing the 50 largest manufacturing firms in Ethiopia began their careers in trading companies, thereby learning about the market and what it takes to meet demand.[76] A large number of founders and leading entrepreneurs in the light manufacturing industries in Asia and Sub-Saharan Africa were initially traders or employees in the marketing division of large enterprises.[77]

Integration in supply chains with larger, often foreign, firms, is receiving much attention as a potential source of knowledge transfers.[78] Indian entrepreneurs returning from Silicon Valley made Bangalore a hub of the information technology industry. Perhaps the most dramatic evidence attesting to the importance of learning from abroad can be found in the case of the garment industry in Bangladesh (box 3.4).

The case for targeted management training

Managerial practices are linked to differences in productivity, profitability, firm growth, and survival.[79] The development experience of the garment industry in Bangladesh suggests that entrepreneurship can be fostered by exposure to advanced management practices and technologies. But whether managerial capacity can be improved through management training is more debatable. Creativity, foresight, and risk taking are key elements of any innovative process, but the question is whether they can be diffused and nurtured.

A substantial number of experiments have been conducted in recent years, providing evidence of both successes and failures of management training interventions. Some patterns emerge from a systematic review of the available evidence. To be successful, management training must be kept simple, appropriate teaching materials must be available, and the training must

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BOX 3.4   *What explains the boom in the garment industry in Bangladesh?*

The garment industry in Bangladesh illustrates how important it is to learn advanced management practices, marketing, and technologies from abroad. When Daewoo Corporation of Korea teamed up with Bangladesh's Desh Ltd. to produce garments for export in Bangladesh in 1979, the South Asian country had no modern industry. Little more than 20 years later, the industry was generating more than US$12.5 billion in export revenue. Women accounted for 80 percent of its 3.6 million workers

Arguably, a wide set of factors, from financial innovation to policy support, contributed to this development success. But it began in 1979, when Desh sent 130 newly recruited, educated employees to Daewoo's garment factory in Korea, where they participated in an eight-month intensive training course covering topics from sewing skills to factory management, quality control, and international procurement and marketing—skills that they then applied in the Desh factories in Bangladesh. Within a few years, almost all the trainees had left Desh to start their own garment businesses. Some of the ex-Desh workers joined new garment factories established by affluent businessmen, while others founded trading houses, which then

contributed to the proliferation of garment manufacturers by providing a variety of valuable services including international procurement and marketing, sample making, and design reengineering.

Observing Desh's good start in exporting, and subsequently the success of ex-Desh workers, highly educated people started their own garment businesses, and wealthy families actively invested in the industry. As a result, the size of garment firms has been quite large since the beginning; their average size was 300 workers in 1983–84 and 700 in 2010–11. As of 2005, owners of garment firms had 15 years of schooling on average, and about 60 percent of them had completed college or university education.

Learning from abroad continued. Some entrepreneurs participated in training programs in Singapore, Japan, and Europe. Beyond garment enterprises in Korea, other newly industrial countries in East Asia followed Daewoo into operation in Bangladesh and invested in training Bangladeshi workers and managers. Thus, many Bangladeshi traders and manufacturers had work experience in garment trading and production, including the experience of working at joint ventures, before starting their current businesses.

Sources: Bangladesh Knitwear Manufacturers and Exporters Association 2012 ; Easterly 2002; Mottaleb and Sonobe 2011; Rhee 1990.

last for a certain minimum length of time. Complementing classroom teaching with instructors' visits to trainees on the job can yield significant positive effects.[80] In Mexico, for example, such on-site visits improved sales, profits, and productivity.[81] But in Ghana, on-site visits and support for microenterprises were not successful.[82] It is also possible that key entrepreneurial skills are gained more effectively through work experience in large productive firms than through training programs.[83]

Entrepreneurship training for women has had mixed results. Nurturing female entrepreneurship has the potential to create wider social benefits associated with female employment, such as changes in the household allocation of resources that improve family well-being, especially of children. Female entrepreneurship often provides employment opportunities to women that allow them to balance work and family roles. Yet providing classroom training to female microentrepreneurs in Peru had no effect on key business outcomes such as sales and profits, even when some business practices improved.[84] Classroom training complemented with on-site visits, though, yielded positive results.[85] In Pakistan and Tanzania, management training improved management practices and business outcomes for male but not female entrepreneurs.[86] These mixed results can also reflect wider constraints facing women in societies, including access to effective learning in schools.

A common finding of training evaluations is that the potential to absorb management practices differs greatly among beneficiaries. Readily observable individual characteristics can help identify those business owners with the highest potential to benefit from management training. Expert panels may be used to identify and rank micro- and small enterprises on their potential to grow, but such methods are expensive and difficult to apply on a large scale. An effective alternative is a survey questionnaire designed to capture abilities, attitudes, and management scores of potential trainees.[87] Management training itself can be used as a screening device. Trainees with high potential often undertake new investments and expand employment as a result of their training. Financial institutions could view such activity as an indication of potentially high investment returns. Programs that combine management training with financial support yield better firm performance in developing countries.[88]

Training programs can be implemented by private providers and financed by private investors with a significant interest in the success of the entrepreneurs in whom they have invested. But as long as there are knowledge spillovers and the importance of management expertise is undervalued, governments have a role to play. Given the differing capabilities among business owners, proper targeting is crucial to ensure positive returns to publicly funded programs. Randomized experiments in Ghana, Tanzania, and Vietnam indicate that the benefit of such programs generally outweighs the cost, even though the costs of implementing training programs vary greatly.[89] If the overall investment climate is not conducive to private sector growth, however, targeted training programs for better business skills will most likely return meager results.

Notes

1. Labor force is used instead of employment in figure 3.1. Over a long term (10-year period), changes in unemployment rates are small, in general, and employment in an economy is driven by the size of its labor force.

2. Haltiwanger 2011; Schumpeter 1934.

3. Gross job creation is the sum of all additions to total employment. It occurs when expanding economic units hire workers and when new economic units are created. In principle, economic units can be as small as a one-person microenterprise, but most quantitative analyses refer to establishments employing several workers. Gross job destruction is the sum of all employment losses. It occurs when economic units close or contract in size. Net job creation is the difference between these two gross flows. Job creation and destruction rates measure how many employment positions emerge or disappear in a specific period (typically one year) relative to the number of existing positions. See Bartelsman, Haltiwanger, and Scarpetta 2009b; Davis, Haltiwanger, and Schuh 1996.

4. Kucera and Roncolato 2012; McMillan and Rodrik 2011; Pieper 2000; Timmer and de Vries 2009.

5. World Bank 2009.

6. Duranton 2007, Duranton 2012 for the World Development Report 2013; Duranton and Puga 2001; Henderson 2002.

7. Park et al. 2011; World Bank 2011b.

8. Ghani, Goswami, and Kerr 2012.

9. For a discussion on how to decompose productivity growth by firm dynamics, see Foster, Haltiwanger, and Krizan (2001) and Griliches and Regev (1992).

10. Bartelsman and Doms 2000; Bartelsman, Haltiwanger, and Scarpetta 2004; Foster, Haltiwanger, and Krizan 2001; Roberts 1996; Syverson 2011; Tybout 1996, 2000. The dispersion of productivity across firms is not, by itself, sufficient to gauge the efficiency of the job creation and reallocation process. Poor market structure and institutions can distort the process. See Haltiwanger 2011; Nelson 1981.

11. Bartelsman, Haltiwanger, and Scarpetta 2004; Tybout 1996.

12. Baily, Bartelsman, and Haltiwanger 1996.

13. WDR 2013 team estimation based on Amadeus Database, the Annual National Industrial Survey of Chile, and Ethiopia Large and Medium Scale Manufacturing and Electricity Industries Survey.

14. Dutz and others 2011.

15. Bartelsman, Haltiwanger, and Scarpetta 2004; Rutkowski and others 2005.

16. Brandt and Rawski 2008; World Bank and the People's Republic of China Development Research Center of the State Council 2012.

17. Brandt, Hsieh, and Zhu 2008; Brandt and Rawski 2008; Brandt, van Biesebroeck, and Zhang 2012.

18. Hayami and Otsuka 1993.

19. South Africa is excluded from this figure because it is an outlier, with an average farm size of 288 hectares.

20. In fact, tenancy markets are emerging in Sub-Saharan Africa. See Holden, Otsuka, and Place 2009.

21. Otsuka and Place 2001.

22. Pagés 2010.

23. ADB 2009. The analysis is based on data from India (2004–05); Indonesia (2006); the Republic of Korea (2004); the Philippines (2005); and Taiwan, China (2006).

24. Rijkers and others 2012 for the World Development Report 2013; Pagés 2010.

25. Grimm, Kruger, and Lay 2011; Liedholm 2002.

26. See also Ayyagari, Demirgüç-Kunt, and Maksimovic (2011b) for analysis based on World Bank enterprise surveys; the analysis suggests that small firms contribute significantly to employment and job creation.

27. The body of literature on this subject is enormous. See Barrett, Bellemare, and Hou 2010; Carletto, Savastano, and Zezza 2011; and Larson and others 2012 for the World Development Report 2013.

28. Holden, Otsuka, and Place 2009; Larson and others 2012 for the World Development Report 2013.

29. For example, in Kenya in 2007, the family labor input per hectare in maize production was 418 hours for the top quartile of farms (measured by size), but that input reached 1,032 hours for the bottom quartile.

30. The positive relationship is found not only in such high-wage economies as Japan but also in India recently. See Foster and Rosenzweig 2011; Hayami and Kawagoe 1989.

31. Evenson and Gollin 2003.

32. World Bank 2007. Improvement in agriculture technology can lead to fast growth in productivity in the sector and convergence in aggregate productivity. On the basis of data from 50 countries over 1967–92, Martin and Mitra (2001) found that productivity growth in agriculture was faster than in manufacturing in these countries over the period.

33. However, TFP has been increasing since the early 1980s, suggesting that the Green Revolution has taken place in some areas of Sub-Saharan Africa. See Block 2012.

34. Hayami and Ruttan 1985.

35. David and Otsuka 1994.

36. Ravallion 2005; Ravallion and Chen 2007.

37. Haggblade, Hazell, and Reardon 2007.

38. Christiaensen, Demery, and Kuhl 2011.

39. Hsieh and Klenow 2009.

40. Pagés 2010. Figures are based on physical productivity (or TFPQ), as defined by Foster, Haltiwanger, and Syverson (2008). This factor is a measure of real output per unit of input, which is computed using plant-level price deflators. TFPQ is more precise than TFPR—a revenue proxy for TFPQ that is computed using industry-level price deflators. TFPQ is a preferred measure because TFPR combines the effects of quantities and prices. Quantities and prices are affected by demand factors, quality differences, markups, and potential distortions. A survey of earlier studies based on TFPR did not find a higher dispersion of productivity in developing countries, but those studies are not very informative because they are based on outdated methodologies. See Tybout 2000.

41. Ayyagari, Demirgüç-Kunt, and Maksimovic 2011a.

42. Ayyagari, Demirgüç-Kunt, and Maksimovic 2011a; Haltiwanger, Jarmin, and Miranda 2010.

43. Lin 2012; Wang and Yao 1999.

44. Banerjee and Duflo 2011; Fox and Sohnesen 2012; Schoar 2010; Sutton and Kellow 2010.

45. Fox and Sohnesen 2012.

46. Perry and others 2007.

47. Grimm, Kruger, and Lay 2011; McKenzie and Woodruff 2008.

48. Mertens 2011; *The Economist* 2001; Charoen Pokphand Group, www.cpthailand.com.

49. Kasbekar 2007; Witze 2010.

50. Sonobe, Hu, and Otsuka 2004.

51. Sandefur 2010.

52. Hsieh and Klenow 2011.

53. Liedholm 2002; Mead and Liedholm 1998.

54. Results from 1-2-3 Survey.

55. Grimm, Kruger, and Lay 2011; Kinda and Loening 2008; Loening and Imru 2009.

56. Fajnzylber, Maloney, and Rojas 2006.

57. Bartelsman, Haltiwanger, and Scarpetta 2009a; Haltiwanger 2011; Hsieh and Klenow 2009; Syverson 2011.

58. Banerjee and Duflo 2004; Banerjee and others 2009; de Mel, McKenzie, and Woodruff 2008a; Göbel, Grimm, and Lay 2011; Grimm, Kruger, and Lay 2011; McKenzie and Woodruff 2008.

59. Banerjee and Duflo 2011; Schoar 2010; Sutton and Kellow 2010; Tokman 2007. See de Soto (1989) and Yunus and Jolis (1999) for a more positive view.

60. Fajnzylber, Maloney, and Rojas 2006; results from World Bank's informal enterprise surveys conducted between 2009 and 2010.

61. Djankov and others 2005, 2006b. See also Vivarelli (2012) on the importance of disentangling entrepreneurship drivers to craft policies targeting high potential entrepreneurs.

62. Methodological details of this technique to identify high-potential entrepreneurs can be found in Gindling and Newhouse (2012) for the World Development Report 2013; and Grimm, Knorringa, and Lay (2012) for the World Development Report 2013.

63. Gindling and Newhouse 2012 for the World Development Report 2013.

64. de Mel, McKenzie, and Woodruff 2008b.

65. de Mel, McKenzie, and Woodruff 2009; Sonobe and Otsuka 2006; Sonobe and Otsuka 2011.

66. Bruhn 2008.

67. Baumol 2010; Schoar 2010.

68. Fafchamps and Woodruff 2012.

69. Bloom and others 2011.

70. de Mel, McKenzie, and Woodruff 2010; Fafchamps and others 2011; McKenzie 2010.

71. Gennaioli and others 2011; Kelley, Bosma, and Amorós 2010; van der Sluis, van Praag, and Vijverberg 2005.

72. Bloom and others 2011; Mano and others 2011.

73. Estimate from Brazil's ECINF 2003 survey.

74. Fafchamps and Woodruff 2012; Gindling and Newhouse 2012 for the World Development Report 2013; Grimm, Kruger, and Lay 2011; Otsuka and Sonobe 2011; Sonobe and Otsuka 2006.

75. Sutton and Kellow 2010.

76. Otsuka and Sonobe 2011; Sonobe and Otsuka 2006.

77. Djankov and others 2006a, 2006b.

78. See the initiative by the Inter-American Development Bank, "Bringing Market-Based Solutions to Latin America and the Caribbean to Promote Social Change," http://browndigital.bpc.com/publication/?i=92819.

79. Bennedsen and others 2007; Bloom and others 2011; Bloom, Schweiger, and van Reenen 2011; Bloom and van Reenen 2007, 2010.

80. Drexler, Fischer, and Schoar 2011; Kairiza and Sonobe 2012 for the World Development Report 2013; Mano and others 2011; Valdivia 2011.

81. Karlan, Bruhn, and Schoar 2012.

82. Karlan, Knight, and Udry 2012. In Ghana, the intervention included only a 10-hour consultancy treatment, in contrast to 700 hours provided in a successful Indian program for larger firms that was implemented by Bloom and others (2011).

83. Bloom and van Reenen 2010; Bruhn, Karlan, and Schoar 2010; Bruhn and Zia 2011; de Mel, McKenzie, and Woodruff 2009.

84. Karlan and Valdivia 2010.

85. Valdivia 2011.

86. Berge, Bjorvatn, and Tungodden 2011; Giné and Mansuri 2011.
87. Fafchamps and Woodruff 2012. Alternatively, see the work done by the Entrepreneurial Finance Lab at the Kennedy School (http://www.efinlab .com) on psychometrics tools to uncover successful entrepreneurs.
88. Cho and Honorati 2012 for the World Development Report 2013.
89. Sonobe, Higuchi, and Otsuka 2012 for the World Development Report 2013.

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