



**International
Growth Centre**

EVIDENCE PAPER



FIRM CAPABILITIES AND ECONOMIC GROWTH

Nicholas Bloom (Stanford and IGC), Gregory Fischer (LSE and IGC), Imran Rasul (UCL and IGC), Andres Rodriguez-Clare (UC Berkeley and IGC), Tavneet Suri (MIT and IGC), Christopher Udry (Yale and IGC), Eric Verhoogen (Columbia and IGC), Christopher Woodruff (Warwick and IGC) and Giulia Zane (LSE)

11 April, 2014

The International Growth Centre (IGC) aims to promote sustainable growth in developing countries by providing demand-led policy advice based on frontier research.

DIRECTED BY



FUNDED BY





Contents

Executive Summary	3
1. Introduction.....	8
2. Data.....	9
3. Stylised Facts.....	12
4. Determinants of Low Labour Productivity	25
4.1 Credit Market Frictions	27
4.2 Institutional Constraints.....	29
4.3 Infrastructure.....	37
4.4 Skills and Training	38
4.5 Firm Clusters.....	40
4.6 Markets for Inputs and Outputs	40
5. Resource Allocation	42
6. Conclusion.....	46
References	49



Firm Capabilities and Economic Growth

Nicholas Bloom (Stanford and IGC), Gregory Fischer (LSE and IGC), Imran Rasul (UCL and IGC), Andres Rodriguez-Clare (UC Berkeley and IGC), Tavneet Suri (MIT and IGC), Christopher Udry (Yale and IGC), Eric Verhoogen (Columbia and IGC), Christopher Woodruff (Warwick and IGC) and Giulia Zane (LSE)¹

Executive Summary

The IGC Firm Capabilities Research Programme pulls economists with a common interest in firm capabilities together to focus on three core questions: (i) what are the key proximate determinants of firm productivity? (ii) Where does the productive capacity of firms originate? (iii) What are the barriers that prevent resources from moving from unproductive firms and sectors to areas of higher productivity? In addition to the focus on larger firms within the manufacturing and service sector, small firms (and farms) are also examined to reflect the fact that the majority of citizens in developing countries are not employed by large firms.

This evidence paper on firm capabilities is structured as follows. In Section 2 we discuss available data sets on firms in developing countries. This serves to emphasize how little we know about this sector and in this section we present some ideas on how to expand and improve our evidence base in this area. In Section 3 we present stylised facts about firms in developing countries. Section 4 therefore examines the determinants of low labour productivity. Here we not only look at what factors are associated with low labour productivity but also ask where differences in productive capacity across firms come from. This, in turn, greatly constrains our ability to design effective policies to encourage industrial development. In Section 5 we take on the broader question of resource allocation and examine what prevents resources to move from unproductive sectors and firms to more productive areas.

Currently most of what we know comes from the few countries that have made their industrial survey and censuses available to researchers. Firm data collected by third

¹ Nicholas Bloom, Gregory Fischer, Imran Rasul, Andres Rodriguez-Clare, Tavneet Suri, Christopher Udry, Eric Verhoogen and Christopher Woodruff are Directors of IGC Firm Capabilities Research Programme; and Giulia Zane is PhD student at LSE. Imran and Gregory are grateful to Vittorio Bassi (IFS) for excellent research assistance.



parties such as the World Bank Enterprise Surveys (WBES) are also useful. There are however important limitations of these different datasets. First, with the exception of data from Mexico and India, most of the existing surveys only survey large industrial firms. Second, many of the forces that we believe are important to a firm's capabilities are rarely measured in existing datasets. Third, we believe it is important to measure entrepreneurship. Fourth, much of what we know about farms and small informal firms comes from household surveys that do not collect much of the information needed to look at barriers to productivity increase.

The IGC will support research that develops new methodologies to construct appropriate measures of the drivers of firm productivity from existing data. For example, the "enterprise maps" compiled by John Sutton and co-authors in Ethiopia, Ghana, Tanzania, and Zambia are based on detailed original surveys of the fifty leading firms in each of these countries. Specifically, Sutton's research finds that few of the leading firms in these countries originated as small firms; rather they are more likely to have been started by entrepreneurs engaged as brokers in foreign trade. We want to know whether this finding holds more systematically in other countries

The IGC Research Programme aims to find the explanations to some stylised facts associated with developing countries. It has been widely observed that labour productivity is several times greater in developed countries than in developing countries. Explaining why this is the case, by delving into firm level data and by collecting more firm level data to identify the determinants of low firm productivity, represents a major objective of the Research Programme. It is also observed that the size distribution of firms in most developing countries is heavily concentrated around firms with relatively low levels of employment, even when one excludes sole proprietors. Two immediate questions are raised by the presence of a much thicker left-hand tail of the firm size distribution. First, why do low productivity firms not improve their productivity? Second, why do markets not force the less productive firms out of business?

We address the question of low productivity by examining information on the constraints face by the firms in the WBES – in this survey firms are asked to choose the largest obstacle they believe they face from a list. Difficulty in accessing credit features prominently in all IGC countries. Another obvious candidate is constraints related to "institutions." Indeed, in eight IGC countries, more entrepreneurs report institutional constraints as being more important than those related to finance. Infrastructure is seen as a major impediment to expansion and growth in most developing countries



and this is true for both small and large firms. Another important constraint facing firms in low income countries is the absence of adequately skilled workers and managers. The structure of the market for inputs and outputs may also play an important role in addition to its incentive effects on productivity. In the IGC's previous work in Sierra Leone, Rwanda, and Pakistan, our research has shown that the market structure of the agricultural supply chain has important effects on prices and thus farmer welfare.

Moving beyond the material captured in available firm level datasets, we have abundant evidence that the clustering of firms, particularly in industrial sectors, produces positive externalities that are important for capturing local spillovers and fostering industrial development. One of the important spillover effects of this is in knowledge: firms may learn from their neighbours, either directly or by hiring workers from nearby firms. Much of the evidence we have on where and why firm clusters form in particular parts of developing countries is descriptive and anecdotal. There is much more research that could be done in this important area.

The last pillar of the research on firm capabilities encompasses understanding the importance of and barriers to effective resource allocation. There exists suggestive evidence that growth is driven by the entry and emergence of new firms and sectors as well as the reallocation of resources from less productive to more productive firms. If resources do not flow into more productive new firms and sectors and if there are impediments to resources being reallocated from unproductive firms and sectors to more productive areas the economic growth is likely to be low for a sustained period of time. The study of firm capabilities therefore has to encompass the study of firm dynamics both in terms of entry and growth of new firms but also in terms of whether more productive firms are growing and less productive ones dying out.

We would like to see much more of type of work where the focus is on identifying constraints on resource reallocation and trying to identify how these constraints can be overcome. More broadly the IGC Firm Capabilities Programme would like to understand the importance of the reallocation of resources from informal to formal firms in manufacturing, from non-exporters to exporters, from small family owned farms to large corporate farms, and from agriculture to industry. The reality in many countries is that this necessary resource reallocation does not take place, resulting in industrial sectors being dominated by a large number of small, unproductive, informal firms. In the agricultural sector, the vast majority of land and people are



employed in small subsistence farms, despite the presence of potentially more productive farms producing cash crops with modern technologies. Furthermore, workers and capital remain locked in less productive agricultural sectors, while it may be the case that these resources could be more profitably employed in other sectors. What are the barriers that prevent the efficient reallocation of resources? What prevents subsistence farmers from moving into cash crops or into urban industrial sectors?

Due to the research that the IGC funded earlier, we know that the magnitude of internal trade barriers does have a potential effect on the growth of firms. Atkin and Donaldson (2012) show that internal trade barriers may be very large in poor countries. In the agricultural context, IGC-supported research suggests that lowering transportation costs in Sierra Leone led to large gains among farmers and also improved competition amongst traders by reducing search costs. In the industrial sector, there is currently little evidence on whether internal trade costs might have similar effects on firm productivity.

One key finding from this evidence paper is that what we know about the production sector in developing countries is very incomplete. Part of the challenge of the IGC Firm Capabilities Research Programme will therefore be to gather better data on firm productivity across the full firm size distribution in developing countries. By gathering this information over time and in a larger number of countries we will be better able to study both the drivers of productivity as well as the resource allocation and structural change processes that underpin economic growth. Our review of the available data on firms in developing countries throws up three major puzzles. The first is why the size of the industrial sector remains so small within the overall economy? The second puzzle concerns why production is concentrated within firms in the left hand tail of the productivity distribution? The third puzzle is why more resources not reallocated from unproductive firms and sectors to productive firms and sectors in developing economies?

Production in developing countries is concentrated in firms that are both small and unproductive. This is true whether we look at agriculture, manufacturing or services. The small size of the industrial sector, and the focus of production on unproductive firms, helps to explain why aggregate productivity is so low in developing countries. And low productivity ultimately explains why living standards are so much lower in these countries. Understanding why firm capabilities are so low in developing and uncovering ways both to increase labour productivity and to move resources from



unproductive firms and sector to productive ones are therefore of fundamental importance not just for understanding what drives economic growth in developing countries but also for finding the means to close the gap in living standards between developing and developed nations.



1. Introduction

A well-established macro-economic literature² argues that growth and employment generation can be sustained only through increases in productivity at the aggregate level. In turn, productivity at the level of the aggregate economy depends on the underlying productivity of all firms in the economy. This is the case whether we are looking at large formal firms, small informal firms, large commercial farms, or small-scale family farms. This raises three important questions:

1. What are the key proximate determinants of firm productivity?
2. Where does the productive capacity of firms come from?
3. What are the barriers that prevent resources from moving from unproductive firms and sectors to areas of higher productivity?

Work under the IGC Firm Capabilities Research Programme will be focused on these questions. In addition to our focus on larger firms within the manufacturing and service sectors, these research questions reflect the fact that the majority of citizens in developing countries are employed in unproductive small firms (including farms), resulting in an urgent need to think through how to make these firms more productive and also how to encourage the transition of workers into more productive sectors.

The wide distribution of firms in developing countries implies that working on firm capabilities in developing countries requires inputs from economists interested in industrial development, trade, agricultural development and entrepreneurship. The IGC Firm Capabilities Research Programme collects together the top economic researchers in the world with these interests to work on the core questions identified above. These researchers have a common interest in finding means of increasing the productivity of firms at all levels in developing countries with a view to increasing aggregate productivity in these countries.

This evidence paper on firm capabilities is structured as follows. In Section 2 we discuss available data sets on firms in developing countries. This serves to emphasize how little we know about this sector and in this section we present some ideas on how expand and improve our evidence base in this area. In Section 3 we present stylised facts about firms in developing countries. The key stylised fact that emerges is that firms in are much more unproductive that their counterparts in the

² Caselli (2004)



developed world. Not only is the industrial sector in developing countries relatively small but most production also tends to be carried out in firms that are both unproductive and small. Informal firms in the manufacturing and service sectors and subsistence farms are where the majority of the labour force is employed.

Low labour productivity not only constrains economic growth but also the standards of living that an economy can support. Section 4 therefore examines the determinants of low labour productivity. Here we not only look at what factors are associated with low labour productivity but also ask where differences in productive capacity across firms come from.

Our examination of the evidence here reveals our lack of knowledge of the factors which underpin low productivity. This, in turn, greatly constrains our ability to design effective policies to encourage industrial development. In Section 5 we take on the broader question of resource allocation and examine what prevents resources to move from unproductive sectors and firms to more productive areas. We see that competition and trade are particularly important in determining whether resource reallocations take place. What is clear is that entry of more productive firm and sectors and the shift of resources from unproductive firms and sectors to productive ones are both likely to be important. However, we are still at the beginning of understanding what drives these two processes.

2. Data

We begin by discussing available data sources and our plans to develop new data sources. Currently most of what we know comes from the few countries that have made their industrial survey and censuses available to researchers. Firm data collected by third parties such as the World Bank Enterprise Surveys (WBES) are also useful. The countries that have made their data available include Chile, Colombia, Mexico, Ethiopia, India, and China.

Although these surveys are large and have provided valuable information, they are generally difficult to access. In contrast, the micro-data from the WBES is easily accessible. The main limitation of the WBES data is that it only surveys registered private firms with more than five employees. There are also questions about the underlying sampling frame used in the WBES data. Nonetheless, the WBES data is the only data readily available for most of the countries in the world. For example,



they are available for 12 out of 14 IGC countries³ between 2006 and 2011. We will therefore use this data later to present stylised facts on the private sector in the IGC countries.

There are however important limitations of these different datasets. First, with the exception of data from Mexico and India, most of the existing surveys only survey large industrial firms. For example, the widely used Chilean industrial data only covers firms with more than 10 employees. The WBES only covers registered firms with more than five employees. This is problematic in many countries where employment is in non-registered family firms. We are therefore missing a great deal of information because our data does not survey firms in the part of the economy that is central in understanding the constraints to growth in many countries. We will therefore support efforts to measure informal firms, either through expanding existing datasets or by making datasets with information on informal firms, such as the data available from the Indian National Sample Survey and from the Mexican Economic Census, more widely available. Understanding the workings of the informal sector whether this be in small manufacturing or service sector firm or in family run farms represents a major challenge going forward.

Second, many of the forces that we believe are important to a firm's capabilities are rarely measured in existing datasets. For example, although elements such as the use of specific technologies and access to inputs are sometimes measured in agricultural household surveys, such information is rarely collected in surveys of industrial firms. Specifically, many of the most important determinants of a firm's capabilities – such as knowledge, access to global production chains and input markets, use of specific technologies, quality of products, contracting relationships between different firms – are rarely observed in datasets of industrial firms large enough to permit statistical testing.

The IGC has supported original data gathering to address this limitation. For example, the “enterprise maps” compiled by John Sutton and co-authors in Ethiopia, Ghana, Tanzania, and Zambia are based on detailed original surveys of the fifty leading firms in each of these countries. These “maps” provide useful “thick” descriptions of the key sources of the productivity advantages of leading firms in the IGC countries. Another example is IGC funded work by Bloom and co-authors (2013) looking at the process of productivity improvements among textile firms in India, and on-going work by Bandiera, Guiso, Prat and Sadun (2011) analysing the

³ All but Myanmar and South Sudan



use of time by CEOs in India and other countries are examples of this type of work. Such gathering of original data not available in existing datasets will continue to be an important focus of our work in the future.

Third, we believe it is important to measure entrepreneurship. Specifically we want to measure the extent to which entrepreneurs might have created firms in a different institutional environment but did not do so because of the barriers they face in low income countries. Obviously potential entrepreneurs are not measured in any dataset because it is difficult to measure something that did not happen. The Global Entrepreneurship Monitor Adult Population Survey (GEM) is a dataset that might be useful in the future. The GEM is an individual-level survey designed to collect information about entrepreneurial activity and aspirations. It covers five IGC countries (Ghana, India, Pakistan, Uganda, and Zambia) and all surveys are conducted between 2008 and 2010. As yet we have not utilised this survey because the raw data are currently available only for India and Uganda.

Fourth, much of what we know about farms and small informal firms comes from household surveys that do not collect much of the information needed to look at barriers to productivity increase. There is a need to collect more information on household firms and also to link household level data to firm level data where household members work outside the household. This is true both because the much production is household based but also because many individuals divide their time between household based production and outside employment. Obtaining this information over time on the same population of households and on the firms where they are employed would be valuable as it would provide insights into the process of structural change within an economy and what drive this process.

Fifth, we also need to develop new methodological approaches to measure productivity at the firm level. Although the measurement of productivity at this level is the subject of a large academic literature, the standard methods for estimating productivity often assume away exactly the sort of heterogeneity that we believe might be important in the countries the IGC operates in. The IGC will thus support research that develops new methodologies to construct appropriate measures of the drivers of firm productivity from existing data.



3. Stylised Facts

As a motivation for the research programme, this section presents key stylised facts about firms in poor countries. We begin with the key stylised fact we want to explain, namely low labour productivity. Figure 1⁴ displays labour productivity per worker using data on firms with 10 to 49 workers from the World Bank Enterprise Surveys. The median firm with 10 to 49 workers in El Salvador, Burundi, Nepal, Afghanistan, Uganda and Mongolia generates less than US\$4000 per worker in annual sales. In comparison, in Mexico the median firm of this size generates \$17,332 per worker in sales, while firms in Croatia, Turkey and Brazil are generating more than \$50,000 per worker in sales.

Bloom et al. (2010) using accounting data likewise show that the average firm labour productivity as measured by sales per employee is dramatically lower in developing countries. This is shown in Table 1⁵. Figure 1 and Table 1 display a great deal of heterogeneity in labour productivity amongst developing countries but what is perhaps is even more striking in Table 1 is the large gap in labour productivity between developed and developing countries. It is this gap in productivity that underpins differences in living standards between developed and developing countries. Irrespective of the measure we use labour productivity is several times greater in developed countries than in developing countries. Explaining why this is the case, by delving into firm level data and by collecting more firm level data, represents a major objective of the IGC Firm Capabilities Research Programme.

⁴ Source: World Bank Enterprise Surveys, data from Harrison et al. (forthcoming).

⁵ **GDP per capita** from the IMF 2005 in \$PPP. **Sales/Employee** in current \$, across all firms in the ORBIS. Source: Bloom, Mahajan, McKenzie and Roberts (2013).

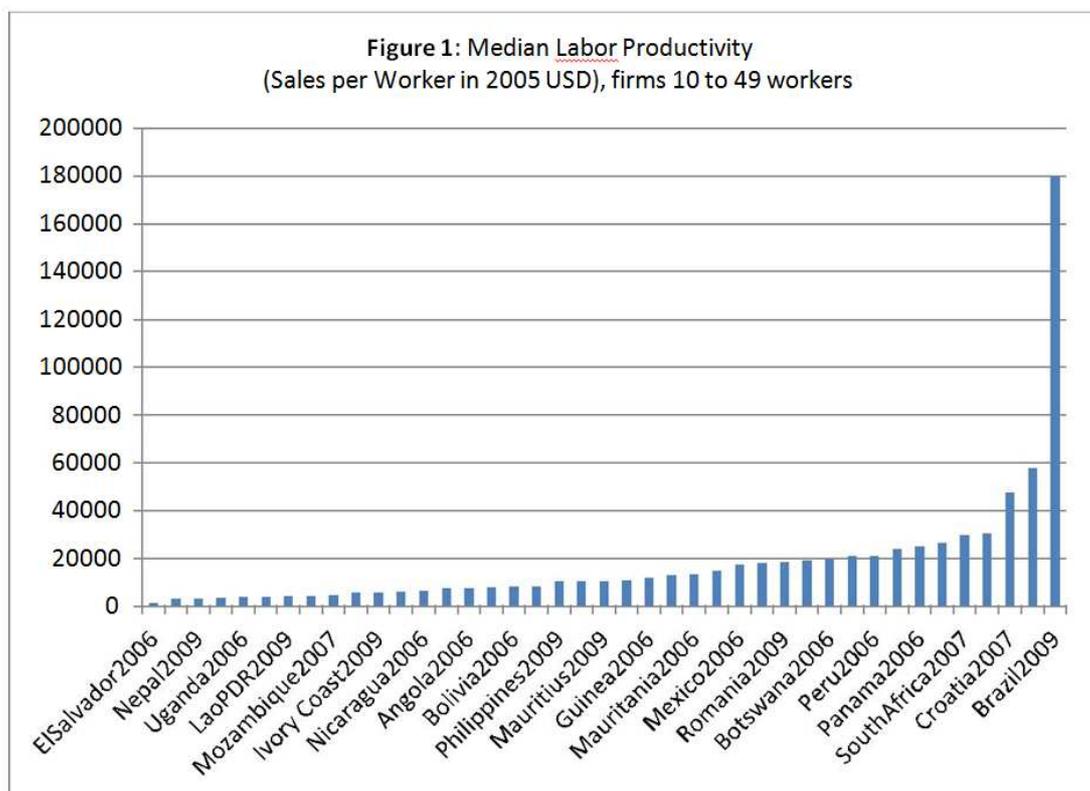


Table 1: Average Firm Labour Revenue Productivity Across Countries

Country	GDP per capita, dollars	Sales per employee, dollars
U.S.	42,736	433,884
U.K.	37,886	457,674
Japan	35,699	428,336
France	35,100	393,024
Germany	33,838	379,341
Greece	22,410	320,859
Poland	7,967	178,525
Brazil	4,787	144,831
Colombia	3,170	150,198
Ecuador	2,814	71,263
Morocco	1,952	105,271
China	1,761	66,885
Indonesia	1,249	80,203
Philippines	1,090	102,975
India	741	120,656



We only know a little about firm characteristics associated with low productivity. For example, Bloom, Sadun and Van Reenen (2012) show that bad management practices are associated with low firm productivity. A specific management practice is the extent of decentralisation of decision-making. Bloom, Sadun and Van Reenen (2012) use the international management practices data to examine patterns of decentralisation across environments. Across countries and regions, they show that decentralisation of decision-making is associated with greater trust and the rule of law being better enforced. This correlation makes sense if we believe that well-functioning legal systems help to deal with contractual problems within firms. They also find that decentralisation and the use of information technologies are complementary with one another. This may be because information technology helps firm owners to monitor firm managers. But it should be obvious that this research only scratches the surface of the determinants of low firm productivity.

Yet, we note that in at least some low income countries, delegation does appear to be possible. There is a large number of very large business groups involved in the manufacture of garments sector in Bangladesh and in the manufacture of textiles in India, for example. However, such organisations are the exception rather than the norm in most low income countries. One way in which this fact may show up is in the skewed distribution of firm productivity. Specifically, the size distribution of firms in most developing countries is heavily concentrated around firms with relatively low levels of employment, even when one excludes sole proprietors (see Hsieh and Klenow 2009). For example, in Mauritius, out of the 91,980 manufacturing units with nine or fewer workers, 70.6% have only one or two workers, and only 6.2% have five to nine workers, while there are only 841 manufacturing firms in the whole country with 10 or more workers.

Similar skewed distributions are found in other in a range of other developing countries. In Tanzania there are only 80 manufacturing firms with 100 or more workers, compared to 695 with 10 to 99 workers, and 24,204 with fewer than 10 workers⁶. In Sri Lanka, 92.8 percent of manufacturing establishments have fewer than 10 workers. In Mexico and Bolivia, 91 percent of manufacturing establishments employ fewer than ten workers, while less than 2 percent have 100 or more workers. The percentage of microenterprises is even higher outside of manufacturing, with 97

⁶ McKenzie, 2011



percent of retail firms and 94 percent of services firms in Mexico having fewer than ten workers⁷.

When we consider firms with 10 or more workers, Table 2 shows that the majority of these firms employs only 10 to 49 workers, while in most countries only 15 to 20 percent of firms with 10 or more workers have at least 100 workers. We also see similar evidence from other studies. Bloom and Van Reenen (2012) show there is substantially more dispersion in management practices in India and China than in the United States and northern Europe. Hsieh and Klenow (2009) present evidence showing more dispersion in total factor productivity in India and China, compared with the United States. By either measure, we see a much thicker left-hand tail of low-productivity firms surviving in China and India. What is also interesting is that, relative to firms in developed countries, firms do not grow much with age in developing countries (Hsieh and Klenow 2012). This suggests that firms, even if they survive, are hindered from growing to scale in low income countries.

Table 1: Size Distribution of Manufacturing Firms with 10 or more employees in Selected Countries

	Distribution of Number of Firms (percent)			Distribution of Employment (percent)		
	10-49 workers	50 to 99 workers	100 + workers	10-49 workers	50 to 99 workers	100 + workers
Argentina (1993)	78.5	15.4	6.2	31.6	24.3	44.1
Bolivia (1992)	82.9	9.9	7.2	41.7	17.5	40.8
Chile (2006)	61.1	17.3	21.7	14.6	12.3	73.1
Colombia (1998)	60.3	18.2	21.5	15.6	14.5	69.9
Ecuador (2005)	61.5	16.0	22.5	12.8	10.2	77.1
El Salvador (2005)	70.2	14.3	15.5	21.5	15.0	63.5
Mauritius (2007)	66.2	16.8	16.9	<u>n.a.</u>	<u>n.a.</u>	<u>n.a.</u>
Mexico (2004)	72.4	11.4	16.2	17.5	9.7	72.8
Sri Lanka (2003)	74.9	10.9	14.2	18.3	9.7	72.0
Uganda (2006/7)	84.4	7.9	7.6	<u>n.a.</u>	<u>n.a.</u>	<u>n.a.</u>
Uruguay (2005)	50.3	23.4	26.3	13.3	16.0	70.7
Venezuela (2001)	41.8	15.9	42.4	6.7	7.0	86.3
United States (2005)	64.3	16.2	19.6	16.5	12.9	70.6

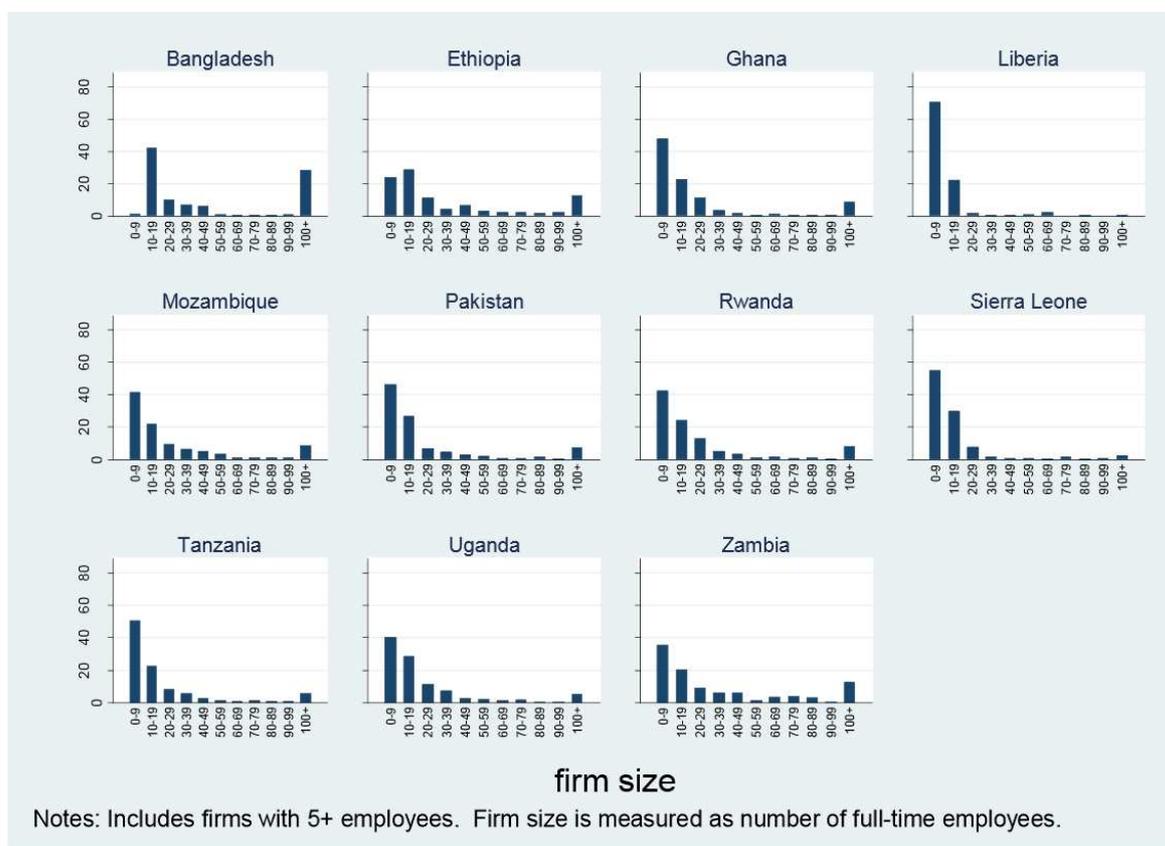
Source: Data on Latin American countries and U.S. from Pages (2011, p.78); Sri Lanka data from Sri Lanka Department of Census and Statistics; Uganda data from Uganda Bureau of Statistics; Mauritius data from Statistics Mauritius.

⁷ Pagés, 2011



Figure 2A presents similar data of the skewed size distribution for the IGC countries from the WBES.

Figure 2A: Firm Size Distribution (Number of Employees), by IGC Country



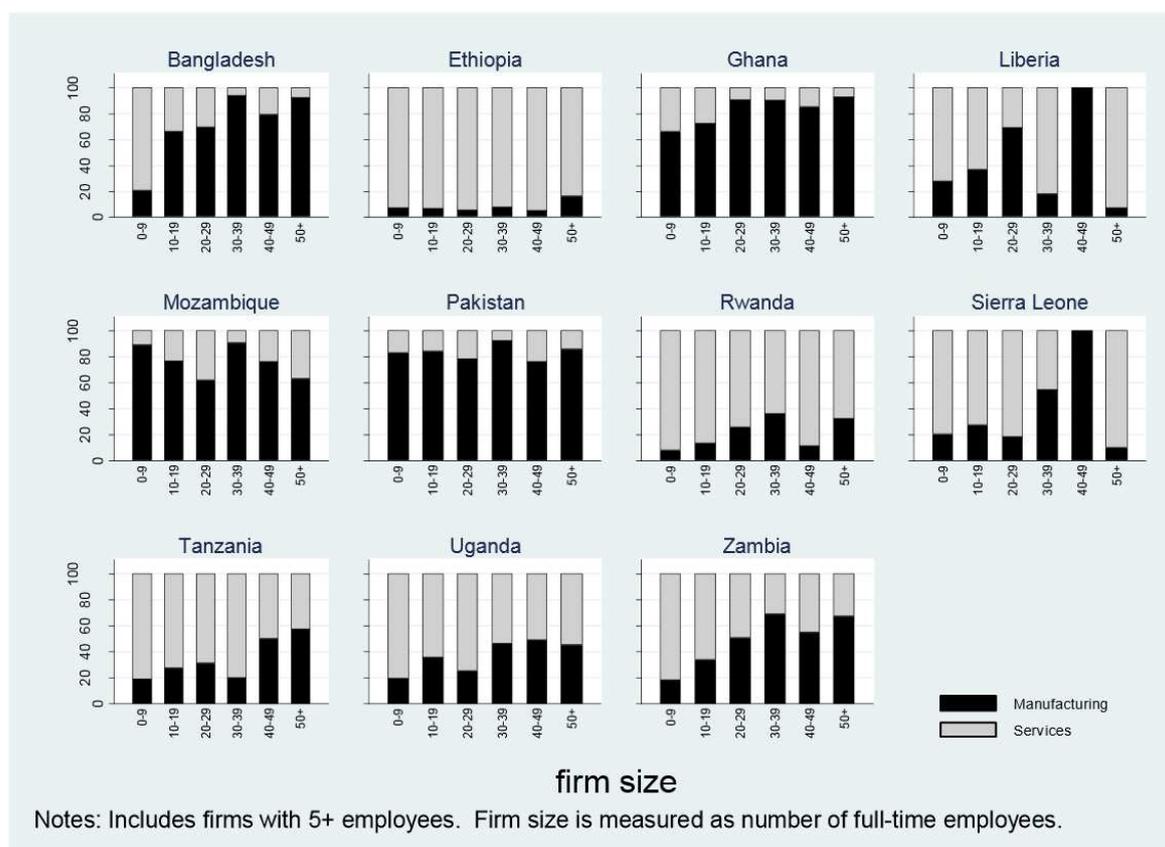
As can be seen, the firm size distributions are quite similar across IGC countries. The modal group consists of firms of size 0-9 full-time employees in nearly all IGC countries, except Bangladesh and Ethiopia. If informal firms were included, we would expect this pattern to hold throughout. It is also interesting to note that the proportion of firms that are very large (with 100+ employees) varies across IGC countries. For example, 28.1% of registered firms in Bangladesh are in this part of the firm size distribution. In contrast, Liberia has almost no such firms. Indeed in Liberia less than 1% of firms have more than 70 employees.

Figure 2B shows the distribution of firm size in the manufacturing vs. the services sector. Given the skewed distribution of firm size shown in Figure 2A, this



breakdown in sectoral composition focuses on firms with 0-49 full-time employees, with the rightmost bar includes all firms with at least 50 full time employees.

Figure 2B: Sectoral Composition of Enterprises, by IGC Country



There are two points we take away from this figure. First, there appears to be important differences in the share of the manufacturing sector versus the share of the services sector between countries. In countries such as Bangladesh, Ghana, Mozambique, Pakistan and Zambia, the formal sector appears to be dominated by manufacturing firms (in all size categories). In countries such as Tanzania, Ethiopia, Uganda, and Rwanda, formal firms appear to be largely in the service sector. So to the extent that formal firms are important, it appears that such firms are missing in the service sector in some countries and in the manufacturing sector in other countries.

This pattern also shows up in other data sources. For example, The World Bank’s “Ethiopia at a Glance” report indeed does seem to suggest that the manufacturing

sector is indeed very small, with less than 6% of GDP arising from the manufacturing sectors in all reported years. In contrast, the service sector accounts for around 40% of GDP in years close to the relevant WBES survey year in Ethiopia.

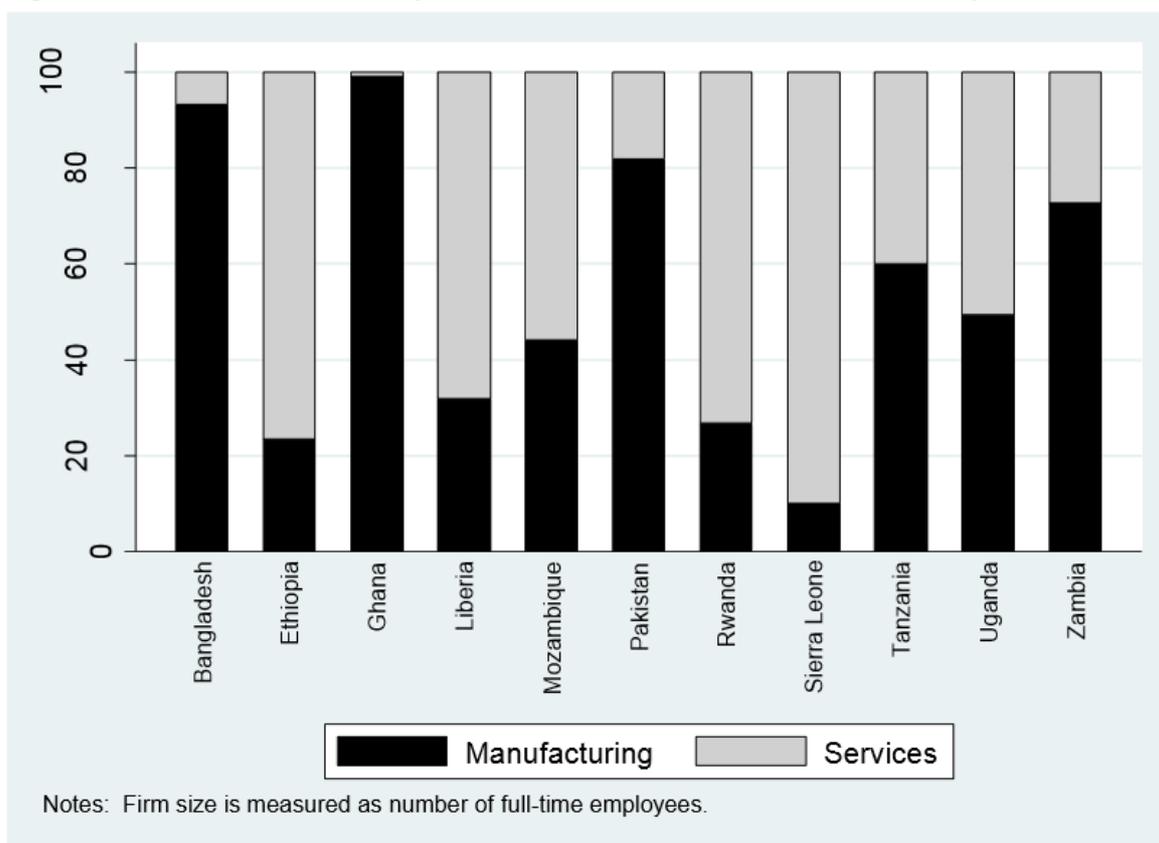
Table 3: Structure of Ethiopian Economy, by Sector, 1991-2011

	1991	2001	2010	2011
<i>(% of GDP)</i>				
Agriculture	64.1	47.7	46.7	46.4
Industry	8.7	13.0	10.3	10.5
Manufacturing	3.0	5.7	3.9	3.6
Services	27.3	39.3	43.0	43.1
Household final consumption expenditure	83.0	75.6	86.1	81.4
General gov't final consumption expenditure	11.0	14.6	8.6	8.1
Imports of goods and services	9.2	23.7	33.0	31.8

For Bangladesh, the 2001 Economic Census suggests that around 88% of established firms are of size 0-4 and 62% are not registered. The manufacturing sector is found to be the most important sector for establishments of size 10+, very much in line with the WBES data.

Figure 2C examines the sectoral composition of larger firms, those with at least 100 full-time employees.

Figure 2C: Sectoral Composition for Firms of Size 100+, by IGC Country



We see there is enormous variation in what larger firms are doing across IGC countries. In some cases there is a contrast with the sectoral focus of smaller firms. For example, in Tanzania the majority of large firms are in manufacturing, while the majority of small firms are in the service sector.

The WBES only captures formally registered firms. However, this data still allow us to explore some features of the informal sector. Specifically the WBES asks firms whether they registered when they started business or after some time and whether they have informal competitors. As Figures 3A and 3B show, this data suggests that the majority of formally registered firms started out as formal registered firms or registered soon after operations commenced. This evidence suggests little movement from informality to formality.

Figure 3A: Firms Formally Registered When Started

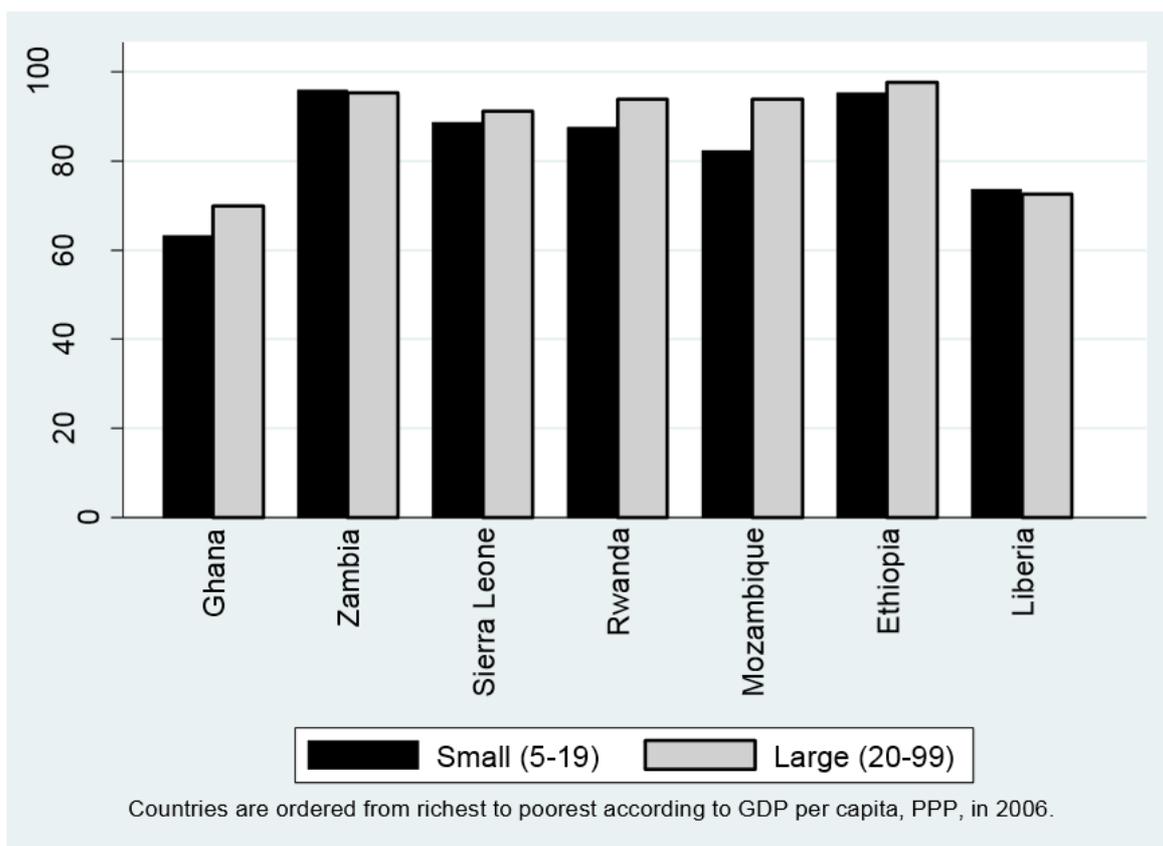
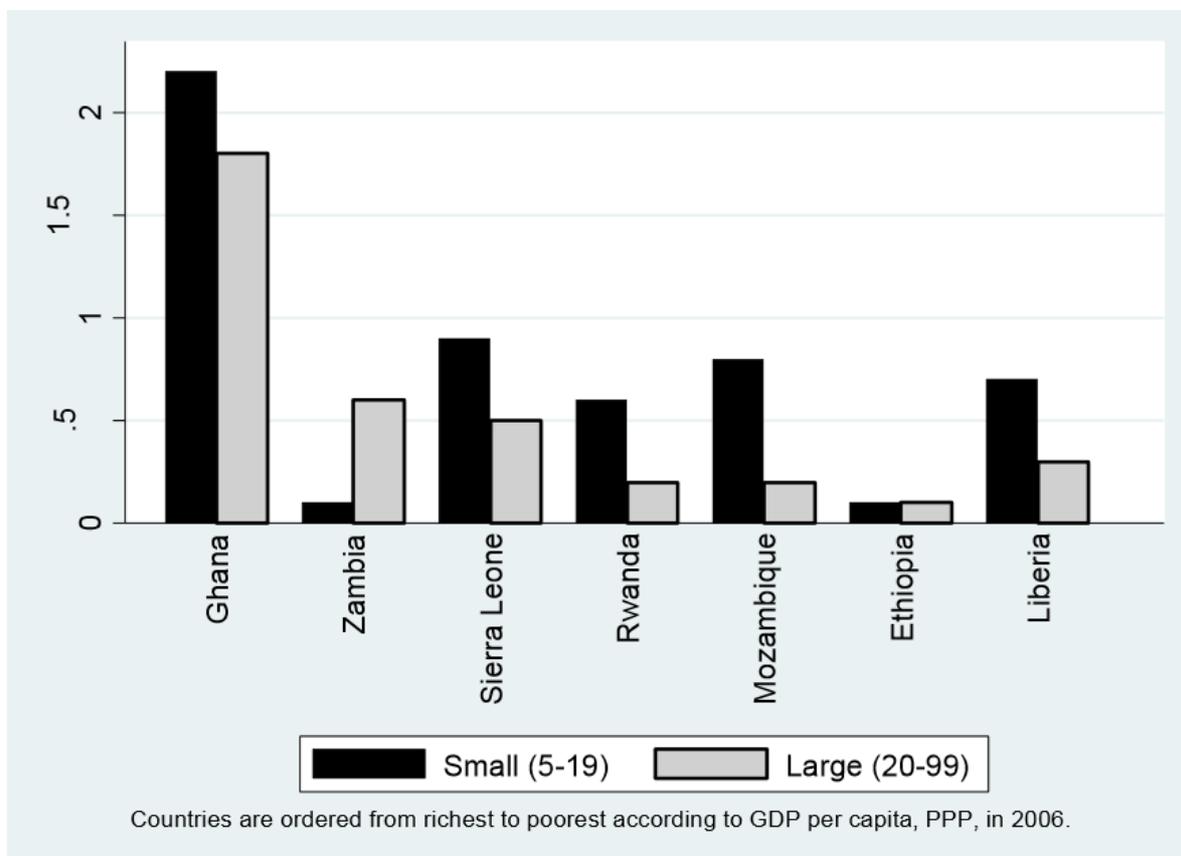


Figure 3B: Number of Years Firms Operated Without Registration

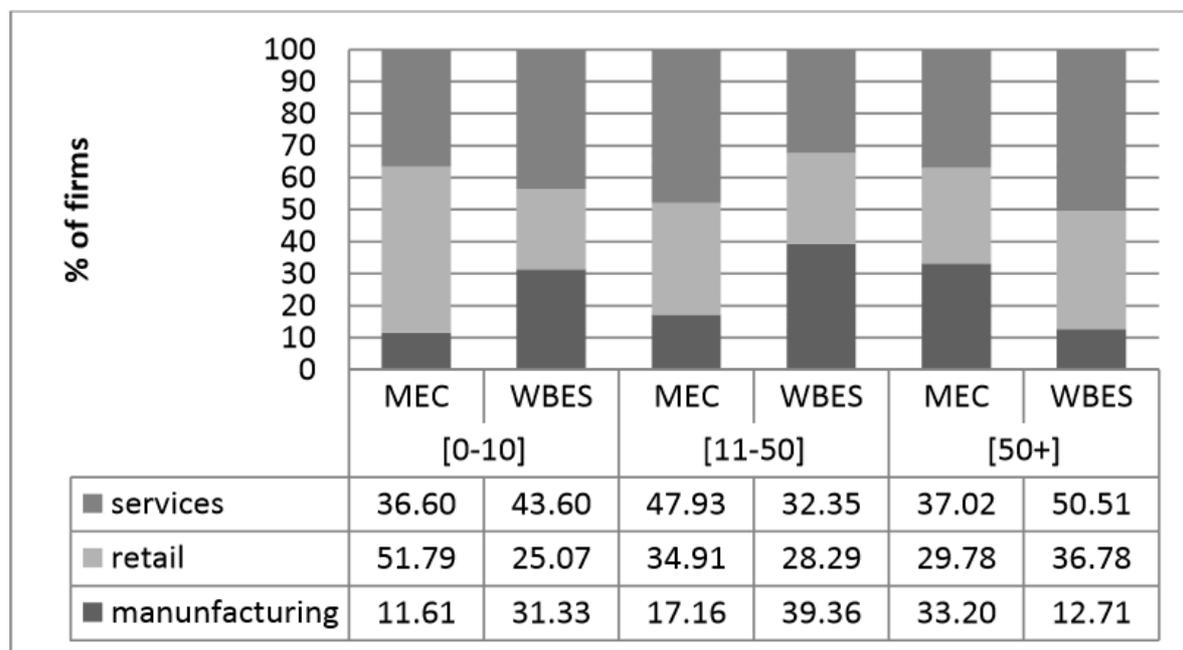


Only a handful of countries make a concerted effort to identify and survey informal firms.

The three countries we know of that survey informal firms are Mexico’s Economic Census (MEC), the survey of informal firms in the Indian National Sample Survey, and the Indonesian Economic Census. Comparing the data from the Mexican Economic Census with the distribution of firms in WBES sample for Mexico provides some indication of the gaps in the WBES data. As shown in Figure 3C, small firms, those with ten or fewer employees, are substantially more prevalent in the Mexican Economic Census, representing over 90% of firms in manufacturing, retail and services in contrast to roughly 40% in the weighted WBES data for the same sectors. This is not a surprise. The WBES is expressly targeting registered firms with five or more employees.



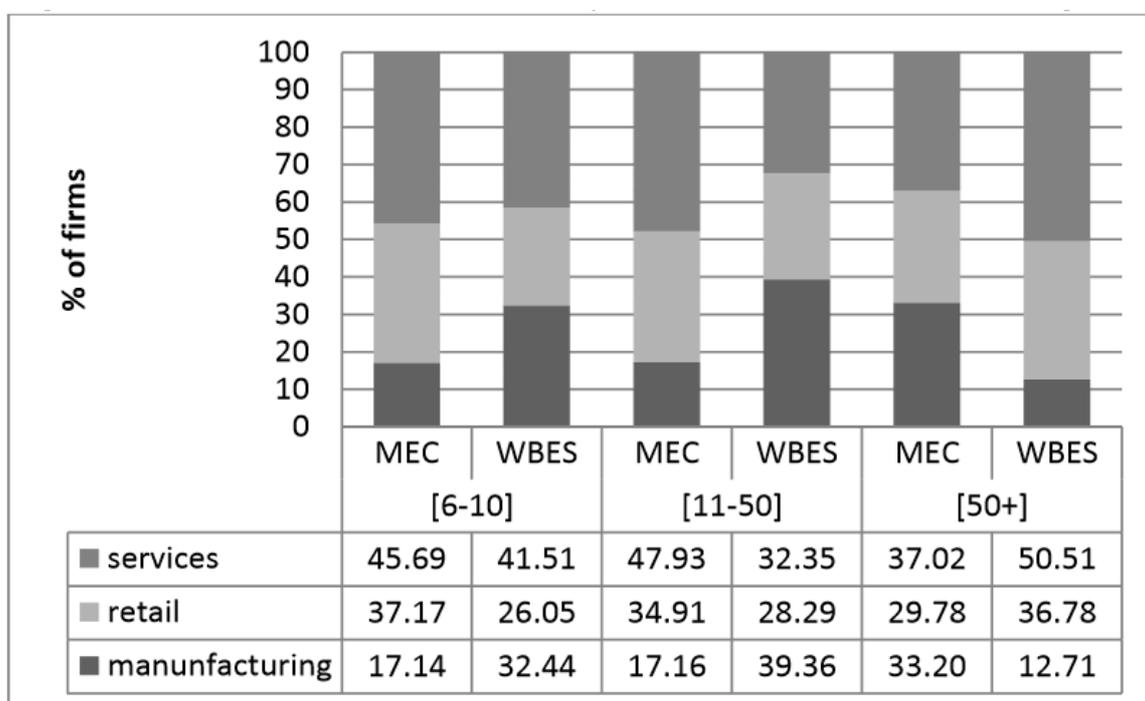
Figure 3C: Sectoral Composition in Mexico, by Establishment Size



Yet as shown in Figure 3B these differences persist, albeit in smaller magnitude, when restricting our attention to just firms with five or more employees in both samples. The magnitude of informality, even in a middle income country such as Mexico, means that the WBES data will yield a misleading picture of the aggregate economy. Figure 3D shows that these differences extend to the measured sectoral distribution, with the Mexican Economic Census over-representing both small retail enterprises and, somewhat surprisingly, large manufacturers relative to the WBES. The variation between these two survey methods underscores the potential challenges of extrapolating from the experiences of formal firms to understand the constraints facing the informal sector.⁸

⁸ Even the Mexican Economic Census data has its limitations. Data from the National Survey of Employment and Occupations (ENOE) suggests that the census captures less than half of total employment and still only 60% of private urban employment. Much of the activity not captured by the census is informal (Busso, Fazio and Levy 2012).

Figure 3D: Firm Size Distribution by Sector in Mexico, Excluding Establishments of Size 0-5



We end this section by noting that we have little evidence on productivity dynamics in developing countries. In high-income countries, data allow a detailed examination of productivity dynamics. Using U.S. data, for example, Foster, Haltiwanger and Krizan (2006) attribute substantially all of the impressive productivity gains in the retail sector during the 1990s to entry of more productive firms and exit of less productive firms. Using data from six narrowly defined manufacturing sectors, Foster, Haltiwanger and Syverson (2008) find that the direct effect of entry explains only around one-quarter of productivity growth. Most productivity growth comes from improvements in incumbent firms.

There are no comparably comprehensive studies of productivity dynamics in low-income countries, and this is something we want to correct. We note, however, that the enterprise maps by John Sutton suggest that the origins of successful firms in developing countries may be quite different than in more advanced countries. Specifically, Sutton’s research finds that few of the leading firms in these countries originated as small firms, rather they are more likely to have been started by



entrepreneurs engaged as brokers in foreign trade. We want to know whether this finding holds more systematically in other countries as if it is indeed the case, it suggests that something is failing in the entrepreneurship process. This finding would also be consistent with the evidence in Hsieh and Klenow (2012) which shows that unlike firms in developed economies surviving firms in developing economies do not show much of growing with age.

Specifically, this failure lies in that very few entrepreneurs manage to grow, almost as if the equivalent of Google in Sub-Saharan Africa never grows beyond the proverbial garage (or living room). We do not know what forces are behind this pattern (assuming it holds up), but we suspect that access to output markets and access to critical inputs such as capital, skills, imported intermediate goods, seeds, and fertilizers (for farmers) may be critical. Understanding what the key forces are is obviously critical, but at this time there is a lack of evidence on the importance of most of these main suspects.

4. Determinants of Low Labour Productivity

Two immediate questions are raised by the presence of a much thicker left-hand tail of the firm size distribution. First, why do low productivity firms not improve their productivity? Second, why do markets not force the less productive firms out of business? Put simply, if management quality is important, why are some firms better managed than others? If access to export markets is critical for productivity, why don't more firms export? If new high-yield seeds or mechanization dramatically improve productivity in the agricultural sector, why don't more farmers adopt these new seeds or technologies? We begin this discussion by presenting information on the constraints perceived by the firms in the WBES. Specifically, in the WBES, firms are asked to choose the largest obstacle they face from a list.

The exact wording of the question is as follows:

Figure 4: WBES Questionnaire

M.1	By looking at card [insert card number] can you tell me which of the elements of the business environment included in the list, if any, currently represents the biggest obstacle faced by this establishment SHOW CARD 25 INTERVIEWER: DO NOT READ OUT
------------	--

1-Access to finance
2-Access to land
3-Business licensing and permits
4-Corruption
5-Courts
6-Crime, theft and disorder
7-Customs and trade regulations
8-Electricity
9-Inadequately educated workforce
10-Labor regulations
11-Political instability
12-Practices of competitors in the informal sector
13-Tax administration
14-Tax rates
15-Transport

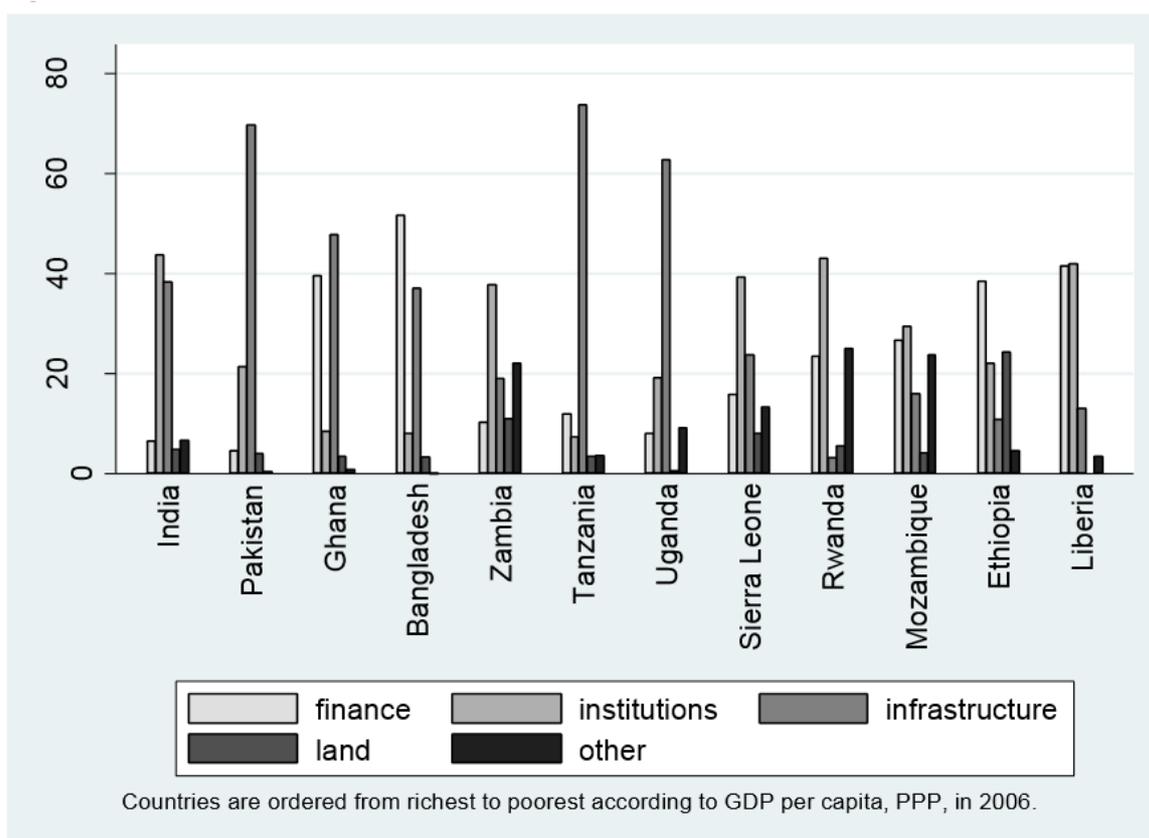
We use this to group constraints into the following categories:



- Institutions:** business licensing and permits; courts; customs and trade regulations; labour regulations; tax administration; tax rates; political instability; crime, theft and disorder; corruption
- Infrastructure:** electricity, transportation
- Finance:** access to finance
- Land:** access to land
- Other:** inadequately educated workforce, practices of the informal sector

Figure 4A shows for each IGC country the main obstacle reported by small, registered firms (firms with between 5 and 19 full-time employees.) To highlight potential correlations with overall economic development, we order the countries by 2006 GDP per capita at PPP.

Figure 4A: Main Obstacle for Small Firms



4.1 Credit Market Frictions

As can be seen, difficulty in accessing credit features prominently in all IGC countries. For example, in Bangladesh close to 50% of small firms report finance as being the key constraint on their expansion. Significant numbers of entrepreneurs also report this constraint as being important in Ghana and Liberia. There is also some evidence that suggests that firms in low income countries are constrained in their access to finance⁹ and characterized by high average returns to capital¹⁰. Broadly the evidence suggests that financial development is associated with higher economic growth and lower poverty. The available evidence, however, has less to say on what precise policy measures might relax credit constraints for firms. The

⁹ Burgess and Pande 2005, Banerjee and Duflo 2012, de Mel et al. 2008

¹⁰ de Mel et al. 2008, Fafchamps et al. 2011



natural question is why such constraints would be binding in the long run if entrepreneurs can build up their capital by saving.

There is also a growing body of work that suggests that small-scale interventions designed solely to alleviate credit market frictions have little effect. For example, many evaluations of microfinance suggest that access to credit alone does not help create new businesses¹¹. De Mel et al. [2010] show that subsidies to working capital to allow firms to hire workers in Sri-Lanka had little effect. Specifically, the subsidy was of a set amount that did not vary across firms and corresponded approximately to 50% of the average low-skill wage in the region. Of the firms offered the subsidy, only 22% employed a new worker.

A possible explanation is that credit market frictions are harmful in combination with other constraints. For example, there is now a large body of evidence that stand-alone short-term training programmes are ineffective in increasing profits and business growth¹². Although there are promising exceptions¹³, it might be the case that such training programmes are only effective if they are accompanied by programmes to improve access to credit. For example, a recent study of business training programmes for aspiring entrepreneurs with and without capital grants provides evidence of such complementarity¹⁴. Bandiera et al (2013) also find that when the poorest women in Bangladesh are offered both capital and training to start up small rural enterprises they experience a 38 percent increase in earnings.

An explanation for the low take-up rate for the wage subsidy found in de Mel et al. [2010] is that there are informational constraints in local labour markets. De Mel et al. [2010] find that only 2% of the entrepreneurs in their sample placed any sort of advertisement to find the new worker and that in as many as 85% of the cases, entrepreneurs employed someone they already knew. But it might also be the case that neither credit market failures nor business skills nor informational barriers are the key constraints, and that other constraints are ultimately what matter.

¹¹ Banerjee et al. 2010, Crepon et al. 2011, Karlan and Zinman 2011, Kaboski and Townsend 2011

¹² Field et al. 2010, Karlan and Valdivia 2011, Fairlie et al. 2012, Bruhn et al. 2012, McKenzie and Woodruff 2012

¹³ Drexler et al. 2010

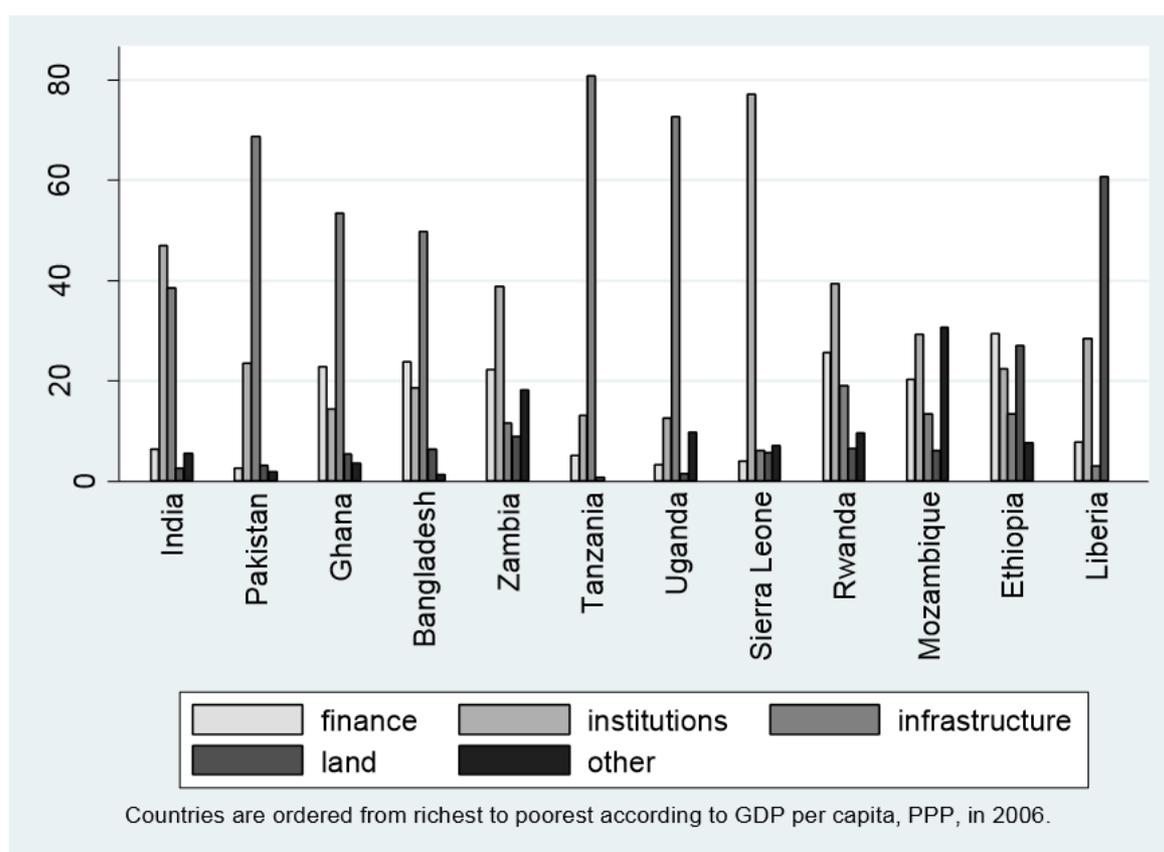
¹⁴ McKenzie and Woodruff 2012



4.2 Institutional Constraints

An obvious candidate is constraints related to “institutions.” Indeed, in eight IGC countries, more entrepreneurs report institutional constraints as being more important than those relate to finance. In Zambia, Sierra Leone, Rwanda, Mozambique and Liberia, it is the most frequently cited constraint from small firms. Figure 4B shows the same information for large firms (those with at between 20 and 99 full time employees)

Figure 4B: Main Obstacle for Large Firms (size 20-99)



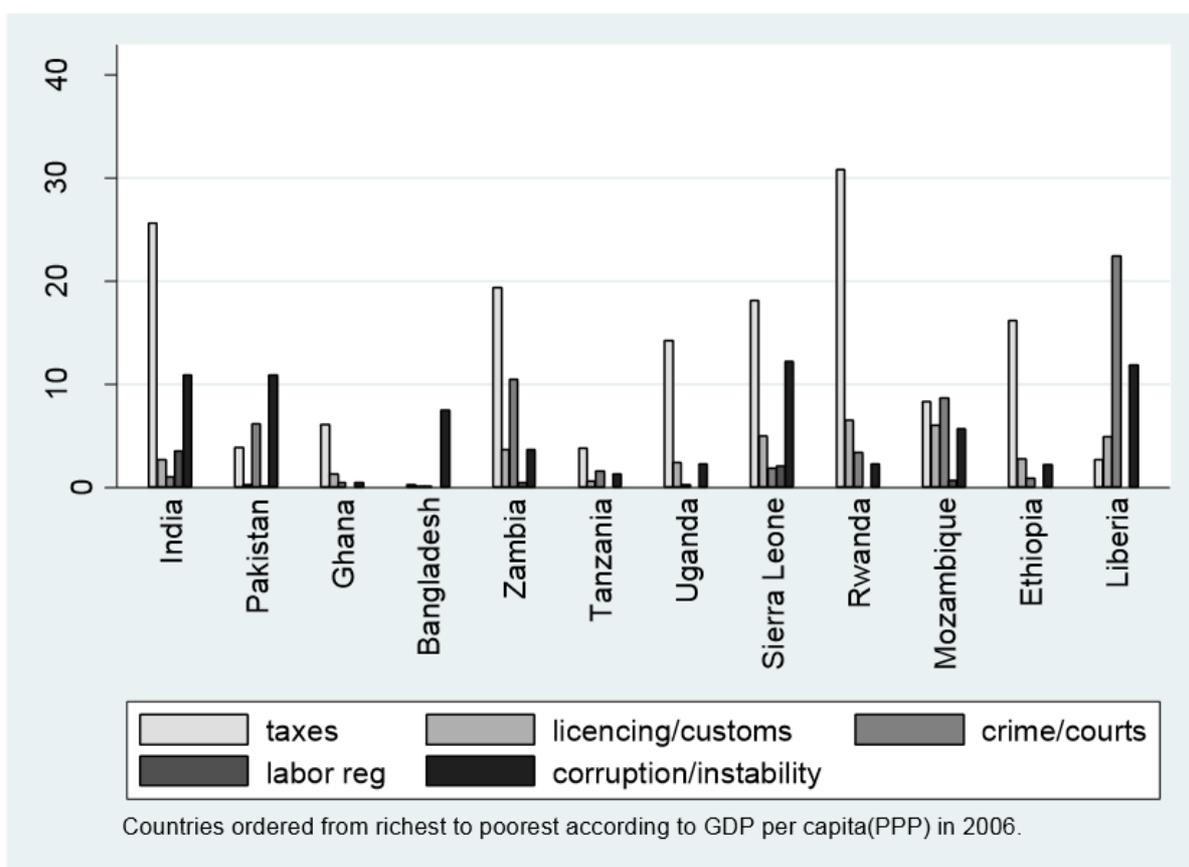
This highlights how the relative importance of constraints changes across the firm size distribution. We see that financing constraints are generally less pressing for these larger firms, while constraints related to institutions still feature prominently. In Zambia, Sierra Leone and Rwanda such constraints remain the most frequent type of constraints mentioned. For a number of IGC countries, smaller firms report such



institutional constraints as significant obstacles to expansion and growth more often than larger firms in the same country¹⁵

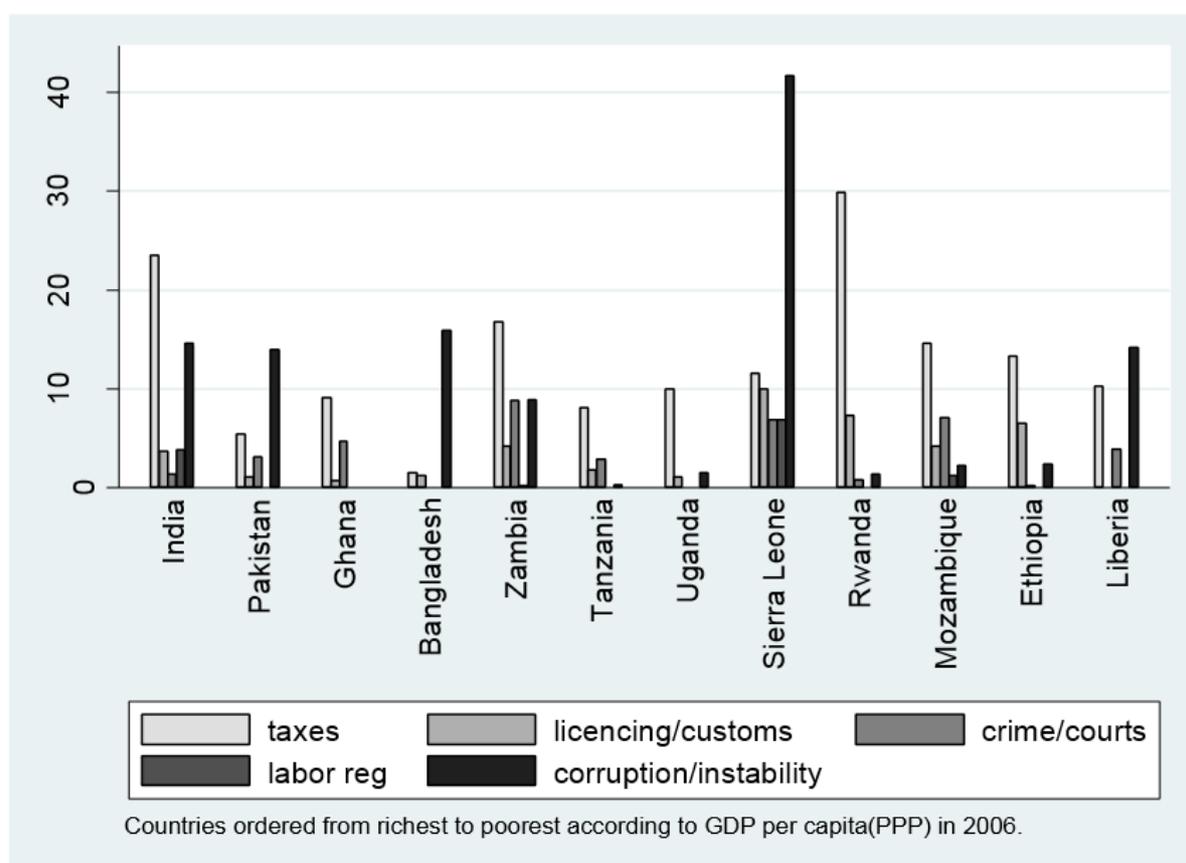
To get a more detailed picture of the underlying institutional constraints that enterprises face, Figures 4C and 4D show the sub-components of institutional constraints reported by small and large sized firms, across IGC countries. Again, we again horizontally rank countries by GDP per capita in 2006 at PPP.

Figure 4C: Institutional Constraints for Small Firms (size 5-19)



¹⁵ Those countries in which institutional constraint are more frequently cited as an obstacle by small firms than large include Liberia (small 41.9%, large 28.4%), Mozambique (small 29.4%, large 29.3%), Rwanda (small 43%, large 39.4%), and Uganda (small 19.2%, large 12.6%).

Figure 4D: Institutional Constraints for Large Firms (size 20-99)



For small firms, taxes are seen as a major barrier to expansion. They dominate reports in India, Zambia, Uganda, Sierra Leone, Rwanda and Ethiopia. They are also seen as a prominent obstacle to expansion in large firms. This suggests that taxes on firms, both small and large, may be preventing them from growing larger. This may in part reflect the fact that taxes in developing countries have relatively narrow bases, or are focused on tax bases such as the formal firm sector that are easy to monitor and tax. Small informal firms in the service and manufacturing sector and small farms may largely avoid taxation though, paradoxically, one of the key reasons that these firms remain small may be that they want to avoid the punitive taxes that would accompany firm growth.

For firms across the firm size distribution, corruption also features prominently as a constraint on growth. There is a tendency for larger firms to report this more frequently than smaller firms, although no clear pattern emerges between GDP per capita and the percentage of firms reporting corruptions as a barrier to growth. This



evidence is consistent with the body of evidence on such institutional constraints. On corruption, Fisman and Svensson (2007) using self-reported bribery payments, find that corruption has a strong negative effect on firm growth in Uganda. Cai et al. (2005), using an alternative measure of bribery, also find that corruption had a strong negative effect on firm performance in China, but this effect is much weaker if firms are located in cities with low quality government services, if they are subject to severe government expropriation and if they do not have a strong relationship with clients and suppliers.

Labor regulation appears to constrain firm expansion in some countries with effects being greater for larger firms. This is consistent with the available evidence. Besley and Burgess (2004) exploit differences in labour regulation across Indian states and over time to estimate their impact on firm performance. They find that more pro-worker regulations lower output, employment and investment in the registered manufacturing sector. In contrast they find that pro-worker labor regulation increases output in the informal sector as investors are more likely to remain small and informal in states with more pro-worker regulations. Ahsan and Pages (2009) in the same setting, distinguish between employment protection and disputes settlement regulation. They find that the former has a negative impact on registered manufacturing sector output and that this effect is larger in more labour intensive industries.

Institutional constraints potentially have important effects on the internal organisation of firms. For example, the difficulty in enforcing contracts and punishing fraud may explain the lack of decentralisation documented by Bloom, Sadun and Van Reenen (2009). The lack of decentralisation may also be related to the high cost of information technology and to the absence of middle managers. The link between trust and IT investments provides a useful link to the broader literature on real versus formal authority¹⁶. Managers are more likely to delegate down the hierarchy when the incentives of lower-level managers are aligned with their own. The ability to provide direct incentives depends on information flows up the organisation. For a variety of reasons – some exogenous and some endogenous to the institutional environment – the cost of transmitting information across levels of the hierarchy are likely to be higher in firms in LICs. The technology of information collection is relatively expensive in LICs, and hence its adoption may be less advanced. Further, thin markets for middle-level management limit the capacity to

¹⁶ Aghion and Tirole (1997)



process the information which may be available.¹⁷ Decentralisation is also associated with more intensely competitive markets¹⁸.

Yet, we note that in at least some low income countries, delegation does appear to be possible. There is a large number of very large business groups involved in the garments sector in Bangladesh and textiles in India, even though these are low trust countries. To achieve this anecdotal evidence suggests firms do three things. First, they try to adopt efficient monitoring systems so they can at least be aware of malfeasance by their employees. If you are worried that employees may, for example, be stealing raw materials from your firm then at least having extensive monitoring limits the extent of this happening until you discover and reprimand the employee. Second, they still largely operate within the confines of the family, so that cousins, uncles, sons-in-law are often employed extensively, so try and exploit some degree of family connection. Finally, to the extent that companies like Tata decentralise decision making to outsiders they do this to long-serving and well paid employees, who are effectively receiving a very high efficiency wage.

The institutional environment may also affect the nature of contracts *between* firms. There is a greater reluctance in low-income countries to switch trading partners, even for standardised products¹⁹. Information about reliability of firms and products is poor and closely held. Formal legal remedies for contractual non-compliance are slow, expensive and unreliable. As a result, buyer-seller relationships develop slowly and buyers are reluctant to switch to new suppliers even when those suppliers offer inputs at a lower price²⁰. These contractual relationships are often managed by market intermediaries. We have somewhat limited knowledge of the effect of these intermediaries on producer firm dynamics. Much of the limited information we have comes from descriptions of agricultural markets.

Such constraints may also affect the ability of a firm to invest in the products that would allow them to grow. Diversification of exports, moving away from commodity exports towards more sophisticated products, and upgrading the quality of existing exports feature prominently on the policy agenda of many developing countries. Hausman, Rodrik and Wang (2005) find evidence that exports of more-sophisticated products are positively correlated with subsequent growth. But this is far from a

¹⁷ Here we rely on ongoing IGC-sponsored work by Woodruff and MacChiavello with large garment manufacturers in Bangladesh.

¹⁸ McAfee and McMillan 1995; Guadalupe and Wulf 2008

¹⁹ See, for example, Johnson, McMillan and Woodruff 2002

²⁰ Banerjee and Duflo 1999; McMillan and Woodruff 1999; MacChiavello 2013

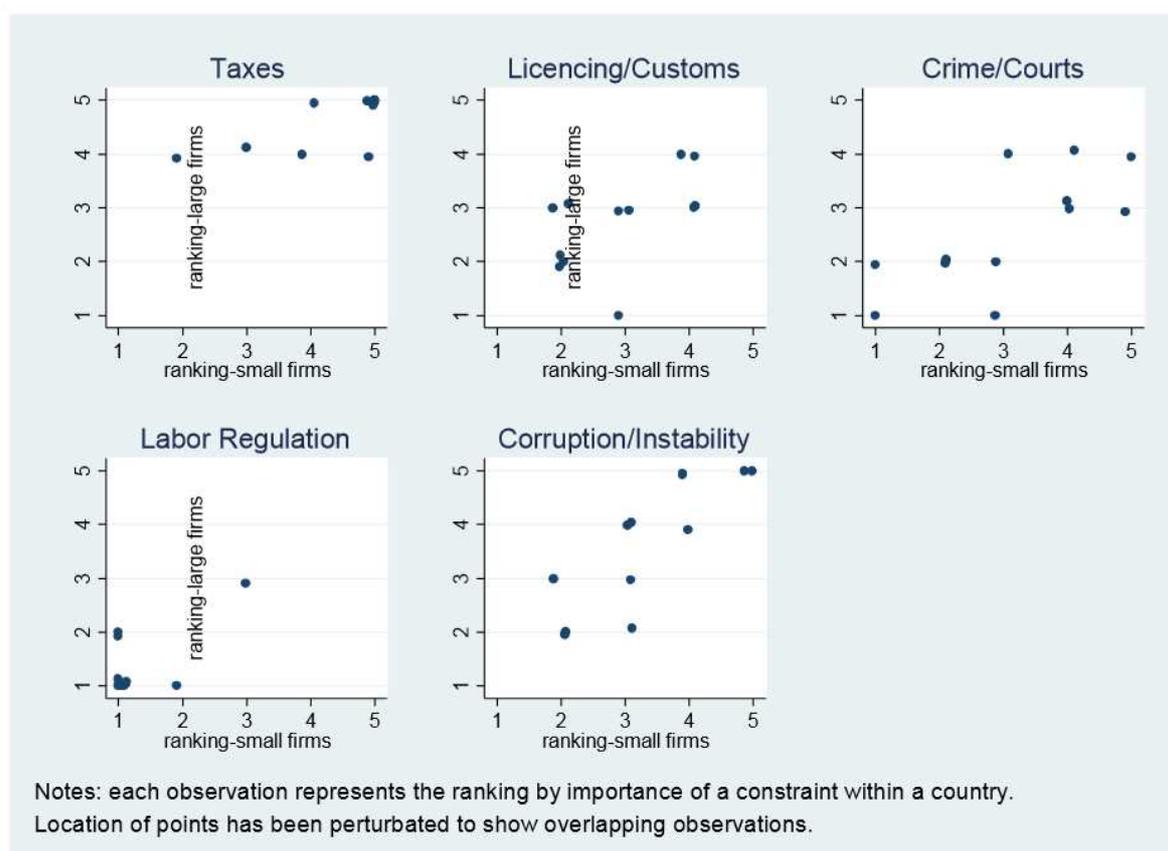


settled matter as some argue that there is no clear case in favour of this view. We believe this issue to be of enormous importance. We will support research that takes advantage of the newly available firm-product-level information to investigate further how product composition evolves as firms learn and grow, and how this process relates to trade patterns and growth at the country level.

This focus includes agriculture as well as manufacturing: agricultural producers seeking to expand into non-traditional products or upgrade existing processes and products face many of the same challenges as manufacturing firms. For an example of this kind of investigation, see Lederman, Rodriguez-Clare and Xu (2011), who investigate how export growth in Costa Rica over the period 1997-2007 is explained by expanding exports of the same products by the same firms to the same destinations versus the reshuffling and reallocations among firms, products and destinations (including entry and exit) over time. Of interest also is a recent compendium of case studies in Latin America of the birth of new export sectors²¹.

Figure 4E brings to the fore how the ranking of constraints differs by firm size in the same country (a rank of one implies it is the most frequently named type of institutional constraint). For most constraints, we see a high correlation between the importance of that constraint as reported by small and large firms. The one notable exception is taxes: this is a far higher ranked constraint for large firms rather than small firms in the same economy.

²¹ Fernández-Arias et al (2012)

Figure 4E: Ranking of Institutional Constraints by Firm Size

The differing constraints for big versus small firms is important in thinking about the underlying sources of the skewed size distribution and for the large degree of informality. For example, De Soto's (1989) work has persuaded many policymakers that many firms want to become formal firms but burdensome regulation prevents small firms from formalising. Partly in response to these arguments, nearly three-quarters of the countries included in the World Bank and IFC's Doing Business surveys have adopted reforms designed to facilitate business registration²².

However, the evidence from such reforms suggests that reducing the costs of formalising has little effect. Much of the work in this area has been done in Mexico, which has both high-quality data on informal firms via its Economics Census and has enacted significant reforms to the formalisation process, including reducing the time to register a firm in some sectors from 30 to 2 days at the municipal level.

²² IFC, 2009



These reforms induced modest increases in formalisation (the fraction of registered businesses increased by 5%) but the mechanism through which even these small changes were affected remains uncertain. Bruhn (2011) finds that any increases appear to be due to new entry rather than the formalisation of existing firms, while Kaplan et al. (2011) use different data and find the opposite result. Furthermore, Busso, Fazio and Levy (2012) provide clear evidence that the reality is much more complex than simply whether a firm is formal or not. They show that in Mexico, most firms are in fact formally registered but still remain small because they can evade taxes by remaining small.

The evidence from the WBES presented above is consistent with the evidence in Busso, Fazio, and Levy (2012). Specifically, the fact that the constraints differ between small versus large firms suggests that informality and the skewed size distribution may be driven by the perceived benefits of informality (and remaining small) rather than the high upfront cost of formalisation. Put simply, the tradeoff is between the importance of the constraints that big firms face versus the constraints that small firms face, which ultimately is an empirical question.

There is a growing body of evidence that the skewed size distribution and informality stems from benefits of informality relative to the benefits of formality. Maloney (2004) suggests that smaller and less productive firms may get little benefit from formalization, and argues that many firms may rationally choose to remain small and informal. McKenzie and Sakho (2010) demonstrate significant heterogeneity in response to firm registration in Bolivia. Even if formalisation may bring benefits to some small firms, perhaps these benefits are not universal. Jaramillo [2013] studies a registration subsidy for microenterprises in Lima, Peru. He finds that the limited growth aspirations of these firms combined with the recurring costs and low perceived benefits of formalisation yield very low demand for formalisation.

De Mel et al. (2013) provide clear evidence that reducing formalisation costs alone may have a limited impact on registrations and provide further support for the hypothesis that a lack of meaningful ongoing benefits may be the key obstacle to increasing formalisation. This study builds on a randomised experiment testing different incentives for formality in Sri Lanka. Providing information about the registration process and reimbursing all direct costs was not enough to get firms to register. Even with powerful monetary incentives, up to an additional two months of the median profits for firms in their sample, only half of firms choose to register.



4.3 Infrastructure

Infrastructure is seen as a major impediment to expansion and growth in most developing countries and this is true for both small and large firms. In Figures 4A and 4B we see that infrastructure is seen as more important than finance and institutions for a number of countries. For some IGC countries such as Tanzania and Uganda, infrastructure is the dominant constraint. For Liberia, land is the most binding constraint for larger firms. There is of course a large body of evidence on the importance of infrastructure. Aschauer (1989) found a positive relation between infrastructure capital and TFP in the United States. Mitra et al. (2002) estimate this effect for Indian manufacturing sector. They find that infrastructure endowments explain a large part of TFP differences across Indian states. Since the effect they estimate is larger than the one found for the United States, they argue that majority of states in India face a strong infrastructure bottleneck. Donaldson (forthcoming) provides convincing evidence that the expansion of railways in India during the colonial period had a large effect in terms of raising per capita agricultural income.

Within this literature, another strand has focused on specific components of infrastructure and their impact on economic outcomes. For example, in the area of energy, Reinikka and Svensson (1999) use firm-level data to show that the lack of reliable power supply in Uganda reduces private investment productivity by forcing firms to invest in generators and other low-productivity substitutes for reliable public provision of power. The magnitude of these effects remains in question. Recent work by Alcott et al (2013) studies the impact of power shortages on firms' productivity in India. They find that although power cuts are perceived as very damaging by entrepreneurs, the estimated effect is relatively small.

The scope of the market faced by firms may also be limited by the high costs of transportation arising from under-developed transportation networks. There is a recent burst of work related to the effects of transportation infrastructure on a variety of outcomes, including market integration and firm dynamics²³. In IGC sponsored work, for example, Casaburi, Glennerster and Suri (2013) use a regression discontinuity effect to show that road and bridge expansion following civil conflict in Sierra Leone improved market integration and lowered crop prices by improving the match between buyers and sellers. Given the scale of investments in infrastructure, a more careful mapping of the effects of transportation costs on

²³ See, for example, Donaldson 2012 for evidence of transportation cost on the integration of markets and Ghani et al 2012 for more direct evidence on transportation networks and firm dynamics



competition is needed. In particular, the fragmentation of markets caused by the lack of transportation means that highly productive firms in one “market” struggle to take market share from less productive firms in other “markets.”

Infrastructure bottlenecks clearly potentially limit the amount of domestic and international trade. While there is a long body of research of barriers to international trade, there is increasing evidence that trade costs internal to countries are significant and contribute to marked differences in prices, incomes and growth across regions. But we know little about the nature of these internal trade costs and how reducing them would affect economic outcomes. How large are such costs? Are they systematically higher in poor countries? What are their key determinants? To what extent would poor regions benefit from increased investment in roads and other transport infrastructure? Answers to this latter question will shed new light not only on how infrastructure investments should be prioritised domestically, but also potentially on the consequences of integration between rich and poor countries.

4.4 Skills and Training

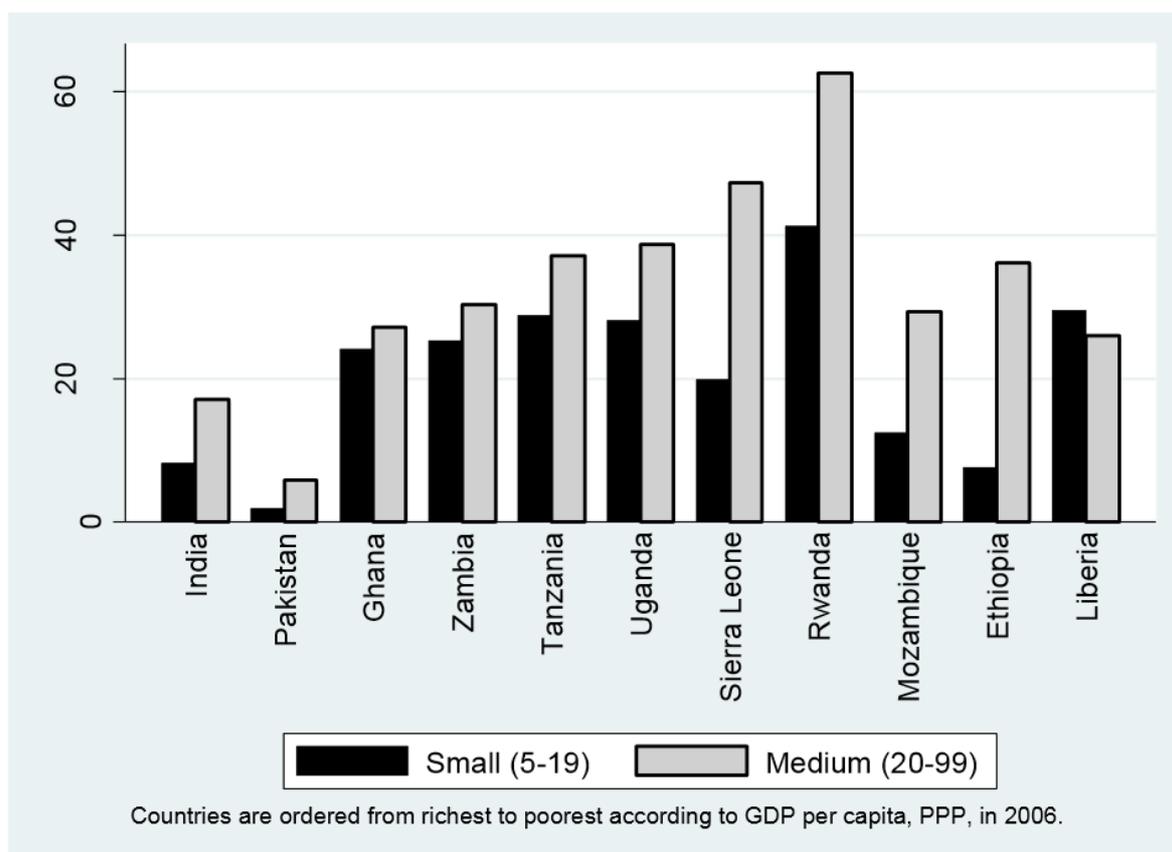
Another important constraint facing firms in low income countries is the absence of adequately skilled workers and managers. Bloom et al (2013), for example, provide anecdotal evidence of the difficulty of finding skilled managers in India. One response of the policy community to this perceived failure are training programmes. Attanasio et al. (2011) use a randomised design to study “Jovenes en Accion”, a training programme targeting disadvantaged youth in Colombia. Card et al. (2011) evaluate a very similar training programme for disadvantaged youth in the Dominican Republic. There is some evidence that these programmes had small effects on labour force participation rates and wages, but there is no evidence that such programmes have a long run effect on occupational structure and questions remain as to whether these programmes crowd out other mechanisms through which people acquire skills. In addition, the goal of all of these programmes is to increase the supply of workers with basic skills, and it is not clear whether this is the binding constraint in terms of labour supply or whether the constraint relates to the scarcity of skilled managers²⁴.

It could also be the case that the most important vehicle through which workers obtain skills is via on-the-job training. The World Bank Enterprise Survey data allows us to explore related issues as measured in the surveyed firms (that covers only

²⁴ As suggested by Bloom et al

formal firms) and among currently employed workers. Figure 5A shows the percentage of firms reporting to provide training to their workers, by IGC country²⁵:

Figure 5A: Provision of Formal Training



As can be seen, many firms provide training and this tendency is more pronounced among larger firms. The WBES data refers to formal training but “on the job” training may also be important, and there are reasons to believe that the workers in large formal firms may also get more “on the job” training. So here, the dominance of small firms in aggregate employment may also have the effect that many workers may not learn new skills that would allow them to increase their wages or to start a new business. We do not know the importance of this, and this is work we want to encourage in the future.

²⁵ Ranked by GDP per capita in 2006



4.5 Firm Clusters

Moving beyond the material captured in available firm level datasets, we have abundant evidence that the clustering of firms, particularly in industrial sectors, produces positive externalities that are important for capturing local spillovers and fostering industrial development. One of the important spillover effects of this is in knowledge: firms may learn from their neighbours, either directly or by hiring workers from nearby firms. Careful research has been done to advance our understanding of such externalities, but the theoretical and econometric challenges remain formidable, especially within developing countries. One key issue is the extent to which knowledge spillovers occur from investment by multinational corporations. There is considerable scope for doing research, for example, on how foreign direct investment and trade liberalization promote firm clustering and expand the span of products that firms can produce (see Goldberg et al, 2010). Much of the evidence we have on where and why firm clusters form in particular parts of developing countries is descriptive and anecdotal. There is much more research that could be done in this important area.

The existence of externalities opens up the possibility of welfare-increasing government interventions. There is however little in the way of rigorous empirical evaluation of such policies. Evaluating industrial policies is challenging since they differ widely across sectors and countries and there is typically no clear counterfactual for comparison. This is especially true in the case of what is often called “new industrial policy,” which advocates a minimalist approach in which governments avoid price distortions and instead establish a process to discover bottlenecks and coordination failures and act directly to resolve them.

4.6 Markets for Inputs and Outputs

The structure of the market for inputs and outputs may also play an important role in addition to its incentive effects on productivity. In the IGC’s previous work in Sierra Leone,

Rwanda, and Pakistan, our research has shown that the market structure of the agricultural supply chain has important effects on prices and thus farmer welfare (see e.g. Casaburi, Glennerster and Suri 2013). IGC research in Ghana and India also shows that the availability of insurance led farmers to invest more and also served to establish the existence of a demand for agricultural insurance in some regions. We suspect that other critical inputs are also missing and that similar forces are at play in the industrial sector.



Specifically, uncompetitive input markets may increase prices and make critical inputs scarce, which have large potentially adverse effects on firm performance. In the agricultural sector, inefficient firms in sectors that sell seeds and mechanical farming equipment could explain why so many farmers still use primitive technologies. One of the key reasons why moving agriculture closer to the production frontier can be beneficial is that the surpluses so generated are often invested in human capital acquisition, migration, and small business creation, which themselves promote economic diversification and economic growth. In the industrial sector, the inefficient electricity sectors in India and Pakistan (and many other countries), the absence of functioning markets for land and office space in urban areas, and the inefficient transportation sector might be behind why many firms remain small and unproductive. Again, more research is required to accumulate the necessary systematic evidence to rigorously approach these questions.



5. Resource Allocation

The last pillar of the research on firm capabilities encompasses understanding the importance of and barriers to effective resource allocation. There exists suggestive evidence that growth is driven by the entry and emergence of new firms and sectors as well as the reallocation of resources from less productive to more productive firms. If resources do not flow into more productive new firms and sectors and if there are impediments to resources being reallocated from unproductive firms and sectors to more productive areas the economic growth is likely to be low for a sustained period of time. The study of firm capabilities therefore has to encompass the study of firm dynamics both in terms of entry and growth of new firms but also in terms of whether more productive firms are growing and less productive ones dying out.

The research by John Sutton funded by the IGC shows has been important in terms of identifying where large firms which produce and export manufactured goods came from in Africa. His finding they originated as trading firms rather than as small producers of manufactures suggests that there may be significant difficulties for small manufacturing firms to grow to scale in these countries. New industrial sectors, such as the flower sectors in Kenya and Ethiopia, are particularly interesting to study as they point to how impediments to resource reallocation can be overcome. IGC has done some path breaking working in this area focussed on how flower producers in Kenya overcome contracting problems with purchaser of flowers in international markets (see MacChiavello and Morjaria 2013).

We would like to see much more of type of work where the focus is on identifying constraints on resource reallocation and trying to identify how these constraints can be overcome. More broadly the IGC Firm Capabilities Programme would like to understand the importance of the reallocation of resources from informal to formal firms in manufacturing, from non-exporters to exporters, from small family owned farms to large corporate farms, and from agriculture to industry. Studying these processes is challenging as it involves looking at large populations of firms across time but the returns, in terms of understanding where growth comes from in developing countries and how it can be encouraged by institutional and policy interventions, is also large.

The available evidence we have suggests that the necessary resource reallocation does not take place in many developing countries. This results in industrial sectors



being both small and dominated by a large number of small, unproductive, informal firms. In the agricultural sector, the vast majority of land and people are employed in small subsistence farms, despite the presence of potentially more productive farms producing cash crops with modern technologies. Workers and capital remain locked in less productive agricultural sectors, while it may be the case that these resources could be more profitably employed in other sectors either in industry or in commercial agriculture.

These observations throw up a number of questions which are fundamental to understanding economic growth in developing countries. What are the barriers that prevent the efficient reallocation of resources? What prevents subsistence farmers from moving into cash crops or into urban industrial sectors? We have a long list of candidate explanations, but there is currently little evidence of which explanations hold the most empirical water. The research undertaken in the coming years will serve to shed light on these questions.

Perhaps nowhere is the issue of resource allocation more important than in trade. There is a large consensus that trade is critical in the development of firm capabilities, and more broadly in allowing poor countries to catch up to rich countries. There are many well-established theories that outline the mechanisms through which this can happen. Traditional theories emphasize how trade allows countries to specialise in sectors where they have comparative advantage²⁶, while new theories emphasise reallocations of resources across firms within industries²⁷, across products within firms and across destination markets for sales of particular products within firms²⁸. Trade allows developing countries to import sophisticated new technology embodied in capital and intermediate goods²⁹. Trade may also lead to gains from increased competition, which may increase allocative efficiency³⁰.

There is a widespread perception that the effects of trade on the development process goes well beyond static reallocations. In particular, trade is thought to affect the growth process through its impact on the accumulation of knowledge – knowledge about how to produce existing products at lower cost or higher quality, about how to produce new products, about what a country is good at producing, about where to find suppliers or buyers, or about what customers want.

²⁶ See, for example, Eaton and Kortum, 2002

²⁷ Melitz, 2003

²⁸ Bernard, Redding and Schott, 2010

²⁹ Eaton and Kortum, 2001

³⁰ Midrigan and Xu, 2012, and Holmes, Hsu and Lee, 2013



Yet the question is why many countries remain poor despite the apparent potential to grow via trade. One hypothesis is that resources need to be reallocated towards sectors in which they have a comparative advantage for this to take place. A related hypothesis is that poor countries may not always reap the benefits of trade liberalisation because of the absence of complementary policies and institutions. As support for these hypotheses, Menezes-Filho and Muendler (2011) track individual workers across jobs after Brazil's trade liberalisation in the 1990s and find that "tariff cuts trigger worker displacements, but neither exporters nor comparative advantage sectors absorb trade-displaced labour." They conclude that, contrary to standard theory, trade liberalisation did not lead to a reallocation of workers out of import-competing sectors and into exporting sectors, but rather into services or unemployment or simply out of the labour force.

One key impediment to labour moving into more productive sectors may be labour regulations. Labour regulations make it unattractive for high productivity firms to expand their employment levels, and this may lead these firms instead opt for employing more capital. Some evidence of this is shown in Aghion, Burgess, Redding and Zilibotti (2008), who show how the dismantling of the License Raj in India (a system of controls affecting entry and production) had more positive effects on manufacturing output in states with more pro-employer labour market institutions. In states where hiring and firing workers was easier labour was more able to flow towards more productive firms and this, in turn, raised labour productivity more than in states where getting rid of unwanted workers was more difficult. Firms in states with pro-employer regulations thus benefited more from the delicensing liberalization than firms in states with pro-worker regulations. This suggests that the growth impact of trade liberalization will be lower in countries where labour market regulations impede the movement of workers across firms.

Barriers to resource allocation are also important in thinking about the sectoral composition of the economy. Recent research shows that poor countries are particularly unproductive in agriculture. For example, Tombe (2012) finds that average labour productivity in agriculture differs by a factor of 70 between the poorest and richest countries, but by only a factor of 6 in non-agriculture. This implies that poor countries have a comparative advantage in non-agriculture tradable sectors, i.e., manufacturing, and yet they devote a large fraction of their resources to agriculture. In a closed economy, this can be explained by non-homothetic preferences: being poor, households in poor countries must spend a large fraction of their income on food, hence leading to a large fraction of labour to



be employed in agriculture. But countries can trade, and so the relevant question is why do they not import food and specialise in manufacturing? Presumably trade costs are large, both to trade with the outside world because of bad port infrastructure and shipping connections (or landlocked countries), and because of poor infrastructure connecting ports to the inland markets relevant for households³¹.

³¹ Tombe (2012)



6. Conclusion

Relative to the study of consumption and households, the study of production and firms has received little attention within development economics. This is changing quickly as macroeconomists and economists interested in industrial development, trade, agricultural development and entrepreneurship move into the study of firm capabilities in developing countries. The IGC Firm Capabilities Research Programme pulls economists with this common interest in firm capabilities together to focus on three core questions. (i) What are the key proximate determinants of firm productivity? (ii) Where does the productive capacity of firms come from? (iii) What are the barriers that prevent resources from moving from unproductive firms and sectors to areas of higher productivity?

One key finding from this paper is that we know staggeringly little about the production sector in developing countries. Part of the challenge of the IGC Firm Capabilities Research Programme will therefore be to gather better data on firm productivity across the full firm size distribution in developing countries. By gathering this information over time and in a larger number of countries we will be better able to study both the drivers of productivity as well as the resource allocation and structural change processes that underpin economic growth.

Building up panel data sets where large numbers of firms can be followed over time is a particular priority as this would allow us to look at firm dynamics and to examine both how the entry of products and firms and the reallocation of resources from unproductive to productive firms drive economic growth. Given the structure of undeveloped economies the study of resource reallocation must encompass the movement of workers from subsistence agriculture into industry and of workers in informal industrial sectors into formal industrial sectors. Linking household data sets with firm data sets over time will be useful in this respect as individuals often divide their time between household based production and outside employment. These processes of occupational and structural change have been understudied in recent years but are fundamental to understanding where economic growth comes from in developing countries.

Our review of the available data on firms in developing countries throws up three major puzzles. The first is why the size of the industrial sector remains so small within the overall economy? This leads us to focus on industrial development as key policy objective in developing countries. The evidence base for discussing industrial



policy has been strikingly poor in developing countries so there a real opportunity to bring new data and theory to bear on this issue. Understanding the role of trade and competition in driving the growth of industrial sectors is likely to be particularly important here. Whether or not firms can effectively respond to greater competitive pressures which come from opening up parts of the economy and whether or not foreign direct investment and international trade will bring in new knowledge and allow new products to be produced are both major questions in this area.

The second puzzle concerns why production is concentrated within firms in the left hand tail of the productivity distribution? This leads us to a focus on understanding what factors are behind differences in firm productivity that we observe both within and across countries. We have reviewed information related to credit market frictions, institutional constraints, infrastructure, skills and training, firm clusters and markets for inputs and outputs. As our review makes plain most of the evidence we have to hand is not rich enough to base economic policy on. We can discern relationships between labour productivity and some policy variables in the data but we are far from understanding what types of interventions will unlock the productive potential of firms. This is, in part, because the set of factors that keep firms in a low labour productivity trap are complex and likely to interact with one another. Providing capital to a small manufacturing firm in Liberia, for example, may have not any discernible impact on labour productivity if the firm cannot find skilled workers. And the need to rely on diesel power generation because of frequent power outages may mean the products the firm produces cannot be competitive to world markets. If one adds the need to pay off industrial inspectors and customs officials then the difficulty of increasing productivity becomes apparent. Attacking single constraints in a disjointed way is unlikely to work.

The third puzzle is why more resources not reallocated from unproductive firms and sectors to productive firms and sectors in developing economies? This leads us to focus on structural transformation and structural change within an economy and to better understand why these change processes are so slow in many developing countries. We have discussed some factors such as regulations and trade barriers which may constrain the ability of factors of production to move across firms and sectors within an economy. But it is clear that we are only scratching the surface. We are at a point where we can describe and quantify the extent to which an improved allocation of resources would contribute to productivity growth but are unable to say how we would go about implementing such a reallocation. Getting into the detail of this will require tracking firms over time and getting into the detail



of how different policy interventions affect resource reallocation. This will be a major challenge going forward.

Production in developing countries is concentrated in firms that are both small and unproductive. This is true whether we look at agriculture, manufacturing or services. The small size of the industrial sector and the focus of production on unproductive firms helps to explain why aggregate productivity is so low in developing countries. And low productivity ultimately explains why living standards are so much lower in these countries. Understanding why firm capabilities are so low in developing and uncovering ways both to increase labour productivity and to move resources from unproductive firms and sector to productive ones are therefore of fundamental importance not just for understanding what drives economic growth in developing countries but also for finding the means to close the gap in living standards between developing and developed nations.

References

Aghion, Philippe and Jean Tirole (1997), “Formal and Real Authority in Organizations”, *Journal of Political Economy*, 105, pp. 1-29

Aghion Philippe, Robin Burgess, Stephen J. Redding and Fabrizio Zilibotti (2008), “The Unequal Effects of Liberalization: Evidence from Dismantling the License Raj in India”, *American Economic Review*, 98(4), pages 1397-1412

Ahsan Ahmad and Carmen Pages (2009), “Are All Labour Regulations Equal? Evidence from Indian Manufacturing”, *Journal of Comparative Economics* 37, no. 1: 62-75.

Aschauer David (1989), “Is Public Expenditure Productive?” *Journal of Monetary Economics* 23: 177–200.

Attanasio Orazio, A. Kugler and Costas Meghir (2011), “Subsidized Vocational Training for Disadvantaged Youth in Developing Countries: Evidence from a Randomized Trial”, *American Economic Journal: Applied Economics* 3: 188-220.

Bandiera, Oriana, Luigi Guiso, Andrea Prat and Raffaella Sadun (2011), “What Do CEOs Do?” *Harvard Business School/Working Paper* 11-081

Bandiera Oriana, Robin Burgess, Narayan Das, Selim Gulesci, Imran Rasul and Munshi Sulaiman (2013), “Can Basic Entrepreneurship Transform the Economic Lives of the Poor?” IZA Discussion Papers 7386, Institute for the Study of Labour (IZA).

Banerjee Abhijit, Esther Duflo, Rachel Glennerster and Cynthia Kinnan (2010), “The Miracle of Microfinance? Evidence from a Randomized Evaluation”, mimeo MIT.

Banerjee Abhijit, and Esther Duflo (2012), “Do Firms Want to Borrow More? Testing Credit Constraints Using a Directed Lending Program”, mimeo MIT.

Banerjee Abhijit, Esther Duflo, R. Chattopadhyay and Jeremy Shapiro (2012), “Targeting the Hardcore Poor: An Impact Assessment”, mimeo MIT.

Bernard, Andrew B., Stephen Redding and Peter Schott (2010), “Multiple Product Firms and Product Switching”, *American Economic Review*, 100(1):70-97



Besley Timothy and Robin Burgess (2004), "Can Labour Regulation Hinder Economic Performance? Evidence from India", *Quarterly Journal of Economics* 119, no. 1: 91-134.

Bloom, Nicholas, Benn Eifert, Aprajit Mahajan, David McKenzie and John Roberts (2013), "Does management matter: evidence from India", *Quarterly Journal of Economics* 128(1)

Bloom, Nicholas, Raffaella Sadun and John Van Reenen (2012), "The organization of firms across countries", *Quarterly Journal of Economics*, 127(4):1663-1704

Bloom, Nicholas and John Van Reenen (2010) "Why Do Management Practices Differ Across Firms and Countries?", *Journal of Economic Perspectives*, 203-224

Bruhn Miriam (2011), "License to Sell: The Effect of Business Registration Reform on Entrepreneurial Activity in Mexico", *Review of Economics and Statistics* 93 (1): 382-86.

Bruhn Miriam, Dean Karlan and Antoinette Schoar (2012), "The Impact of Consulting Services on Small and Medium Enterprises: Evidence from a Randomized Trial in Mexico", mimeo Yale University.

Burgess, Robin and Rohini Pande (2005), "Do Rural Banks Matter? Evidence for the Indian Social Banking Experiment?" *American Economic Review* 95(3)

Busso Matias, Maria Victoria Fazio and Santiago Levy (2012), "(In)Formal and (Un)Productive: The Productivity Costs of Excessive Informality in Mexico", Research Department Publications 4789, Inter-American Development Bank, Research Department.

Cai Hongbin, Hanming Fang, Lixin Colin Xu (2005), "Eat, Drink, Firms and Government: An Investigation of Corruption from Entertainment and Travel Costs of Chinese Firms", NBER Working Papers 11592, National Bureau of Economic Research, Inc

Card David, Pablo Ibarra, Ferdinando Regalia, David Rosas-Shady and Yuri Soares (2011), "The Labour Market Impacts of Youth Training in the Dominican Republic", *Journal of Labour Economics* 29: 267-300.



Casaburi Lorenzo, Rachel Glennerster and Tavneet Suri (2013), "Rural Roads and Intermediated Trade: Regression Discontinuity Evidence from Sierra Leone", mimeo MIT.

Crèpon Bruno, Florencia Devoto, Esther Duflo and W. Parientè (2011), "Impact of Microcredit in Rural Areas of Morocco: Evidence from a Randomized Evaluation", mimeo MIT.

de Mel Suresh, David McKenzie, and Chris Woodruff (2013), "The Demand for, and Consequences of, Formalization among Informal Firms in Sri Lanka", *American Economic Journal: Applied Economics*, American Economic Association, vol. 5(2), pages 122-50, April. de Mel Suresh, David McKenzie, and Chris Woodruff (2010), "Wage Subsidies for Microenterprises", *American Economic Review*, 100(2): 614-18. de Mel Suresh, David

McKenzie, and Chris Woodruff (2008), "Returns to Capital in Microenterprises: Evidence from a Field Experiment", *Quarterly Journal Of Economics* 123, no. 4: 1329-1372.

De Soto Hernando (1989), *The Other Path: The Economic Answer to Terrorism*. New York: Harper and Row Publishers.

Donaldson Dave (forthcoming), "Railroads of the Raj: Estimating the Impact of Transportation Infrastructure," *American Economic Review*.

Donaldson Dave, Arnaud Costinot and Ivana Komunjer (2012), "What Goods Do Countries Trade? A Quantitative Explanation of Ricardo's Ideas", *Review of Economic Studies*, 79(2): 581-608

Drexler Alejandro, Greg Fischer and Antoinette Schoar (2010), "Keeping It Simple: Financial Literacy and Rules of Thumb", CEPR Discussion Paper 7994 Eaton, Jonathan and Samuel Kortum (2001), "Trade in capital goods", *European Economic Review* 45 (7), 1195–1235

Eaton, Jonathan and Samuel Kortum (2002), "Technology, Geography and Trade", *Econometrica* 70(5), 1741–1779



Fairlie, Robert, Dean Karlan and Jonathan Zinman (2012), "Behind the gate experiment: Evidence on effects of and rationales for subsidized entrepreneurship training", Working Paper.

Fafchamps Marcel, David McKenzie, Simon R. Quinn and Chris Woodruff (2011), "When is capital enough to get female microenterprises growing? Evidence from a randomized experiment in Ghana," NBER Working Papers 17207, National Bureau of Economic Research.

Field Erica, Seema Jayachandran and Rohini Pande (2010), "Do Traditional Institutions Constrain Female Entrepreneurial Investment? A Field Experiment on Business Training in India", *American Economic Review Papers and Proceedings*: 100:125-29.

Foster, Lucia, John Haltiwanger and Chad Syverson, (2008) "Reallocation Firm Turnover, and Efficiency: Selection on Productivity or Profitability?" *American Economic Review*, 98, 1:394– 425.

Foster, Lucia, John Haltiwanger and C. J. Krizan (2006) "Market Selection, Reallocation, and Restructuring in the U.S. Retail Trade Sector in the 1990s", *Review of Economics and Statistics* 88(4):748-758

Goldberg, Penelope, Amit Khandelwal, Nina Pavcnik, and Petia Topolova (2010), "Imported Intermediate Inputs and Domestic Product Growth: Evidence from India," *Quarterly Journal of Economics* 125(4): 1727-1767.

Hausmann Ricardo, Jason Hwang and Dani Rodrik (2005), "What You Export Matters", CID Working Paper 123, Center for International Development, Harvard

Holmes, Thomas, Wen-Tai Hsu and Sanghoon Lee (2013), "Allocative Efficiency, Mark-ups, and the Welfare Gains from Trade", Working Paper

Hsieh, Chang-Tai and Peter Klenow (2009), "Misallocation and Manufacturing TFP in China and India," *Quarterly Journal of Economics*

Hsieh, Chang-Tai and Peter Klenow (2012), "The Life Cycle of Plants in India and Mexico," mimeo University of Chicago

International Finance Corporation (IFC) (2009), *Doing Business 2010: Reforming through difficult times*. IFC: Washington, D.C.

Jensen Robert (2012), "Do Labour Market Opportunities Affect Young Women's Work and Family Decisions? Experimental Evidence from India", *Quarterly Journal of Economics* 127: 753-92.

Kaboski Joseph and Robert M. Townsend (2011), "A Structural Evaluation of a Large-Scale Quasi-Experimental Microfinance Initiative", *Econometrica* 79: 1357-406.

Kaplan David, Eduardo Piedra, and Enrique Seira (2011), "Entry Regulation and Business Start-Ups: Evidence from Mexico", *Journal of Public Economics* 95 (11–12): 1501–15.

Karlan, Dean and Martin Valdivia (2011), "Teaching Entrepreneurship: Impact of Business Training on Microfinance Clients and Institutions", *Review of Economics and Statistics* 93: 510-27.

Karlan, Dean and Jonathan Zinman (2011), "Microcredit in Theory and Practice: Using Randomized Credit Scoring for Impact Evaluation", *Science* 332: 1278-84.

Lederman, Daniel, Andres Rodriguez-Clare and Daniel Yi Xu (2011), "Entrepreneurship and the Extensive Margin in Export Growth: A Microeconomic Accounting of Costa Rica's Export Growth during 1997-2007", *World Bank Economic Review*, 25:3

MacChiavello, Rocco and Ameet Morjaria (2013), "The Value of Relationships", *American Economic Review (R&R)*

Maloney William F. (2004), "Informality Revisited." *World Development* 32 (7): 1159–78.

McKenzie, David and Chris Woodruff (2012), "What Are We Learning from Business Training and Entrepreneurship Evaluations Around the Developing World?" mimeo, Warwick University.

McKenzie David and Yaye Seynabou Sakho (2010), "Does It Pay Firms to Register for Taxes? The Impact of Formality on Firm Profitability", *Journal of Development Economics* 91 (1): 15– 24.

Melitz Marc (2003), "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity", *Econometrica*, 71(6):1695-1725



Menezes-Filho, Naércio Aquino Menezes Filho, Marc-Andreas Muendler (2011), “Labor Reallocation in Response to Trade Reform”, NBER Working Paper 17372, National Bureau of Economic Research

Midrigan, Virgiliu, Chris Edmond and Daniel Yi Xu (2012), “Competition, Markups and the Gains from International Trade”, Working Paper

Mitra Arup, Aristomene Varoudakis and Marie-Ange Véganzonès-Varoudkis (2002), “Productivity and Technical Efficiency in Indian States’ Manufacturing: The Role of Infrastructure”, *Economic Development and Cultural Change* 2002: 395–426.

Reinikka Ritva and Jakob Svensson (1999), “How Inadequate Provision of Public Infrastructure and Services Affect Private Investment?” Policy Research Working Paper 2262, World Bank, Washington, DC.

Tombe Trevor (2012), “The Missing Food Problem”, Working Paper