

A snapshot of mid-sized firms in Africa, Asia and Latin America

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Abstract

This report provides a basic set aggregate descriptive data at the country-level collected through the World Management Survey waves, including management practices, work-life balance practices, human capital, decentralization and available infrastructure in medium- and large-sized firms in Africa, Asia, and Latin American developing countries. It also describes the data collection process in great detail. As the database becomes increasingly used by researchers, we hope this report can serve as an “expanded methodology and data manual” for the WMS, where we not only detail the data collection process but also include an Appendix on the construction of the sampling frames. This is particularly important for countries and sectors where we could not find a publicly available list, so we note the challenges of data collection in these countries and how we approached the solutions to these challenges.¹

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¹Note: Most of the data collection took place at the Centre for Economic Performance (CEP) at the London School of Economics. We would like to thank PEDL for the generous funding for the Africa, Myanmar and second Brazilian wave of this project, the IGC for funding for the Mozambique manufacturing and Indian schools, hospitals and retail data collection and the IADB for the Nicaraguan data collection. We also thank Kerenssa Kay and Raissa Ebner for their role as project managers in the data collection phase effort. Most importantly, we thank Nicholas Bloom, Raffaella Sadun and John Van Reenen for the great partnership in this project over the years.

1 Introduction

One of the greatest constraints to the expansion of research into understanding firm behaviour in developing countries is the lack of reliable and comprehensive data. The World Enterprise Survey conducted by the World Bank is a valuable source of aggregate information, and indeed the largest available resource of cross-country comparable firm-level data for developing countries. However, it is not matchable at the firm level to other datasets by virtue of its anonymity. Funding agencies have helped in bridging the gap in available data beyond what is collected by the World Enterprise Survey by generously funding data collection projects, including the dataset described in this report. In this short paper we will provide a set of aggregate descriptive statistics from the data collected for developing countries through the World Management Survey, as well as provide an Appendix that describes the painstaking process of building a sampling frame of firms across countries in Africa, Asia and Latin America. McKenzie & Woodruff (2015) led a similar effort for small and micro enterprises in 2008 and 2014 for seven developing countries. The WMS has a different focus in that it spans 35 countries and focuses on medium and large firms, but the aim of building a new dataset to understand firm practices and characteristics are certainly aligned.

The World Management Survey is a 12-year long initiative aiming to systematically measure the quality of management practices across countries and industries. After collecting management data for over 13,000 manufacturing firms around the world,²

²The WMS team has collected management data from nearly 1,100 retail firms, 1,700 hospitals and 1,800 schools across countries.

we have seen interesting patterns emerge in the management data, but also in the extra information we collect in terms of firm characteristics. Beyond the data collected for developed countries, we have collected 870 data points for firms in Africa, 3,122 in Latin America and 1,998 in Asia (excluding Japan and Singapore). The firms were surveyed between 2008 and 2014, with some being re-surveyed over different years. We have a total of 3,478 unique medium and large sized firms in our sample.

2 Data and methodology

2.1 Data collection process

The first step of this data collection project is to set a sampling frame. We focus on medium-sized firms employing between 50 and 5,000 workers. In order to ensure that our survey sample is reasonably representative of these firms, we draw a random sample from the population of firms in each country. In most developed countries and some emerging economies we are able to find comprehensive lists of registered establishments from companies such as Bureau van Dijk and Compustat. However, suitable listings of manufacturing firms are rarely available for developing countries, particularly for low-income countries that often fail to carry out good quality manufacturing censuses or to make business registry data available to researchers.

To overcome this challenge, we have proceeded in several steps. First, we compile a comprehensive list of firms by i) collecting an initial list from a wide range of in-country data sources such as manufacturing associations, chambers of commerce

and sub-sector directories, ii) conducting a thorough search online for additional lists, and iii) liaising with international and local academic contacts who may have access to partial lists through their research. We detail the careful construction of these primary lists in Appendix B. Second, we searched for detailed contact information (location and landline and/or mobile numbers) from these firms using a variety of online and offline sources as well as contact other businesses in the area that can provide the necessary contact information of the surrounding businesses. This step is crucial to ensure the representativeness of our survey sample as many firms in low-income countries rely on mobile phones to conduct their businesses. In fact, the WMS 2013 survey wave of low-income African countries saw 67% of the firms surveyed over mobile phones.

A possible concern is that a survey of medium-sized firms is not as relevant to studying firms in Africa, Asia and Latin America as this threshold might be too high to concern a substantial share of firms in these countries. This concern stems from the firm-size distribution across countries of different income levels and, particularly, the prevalence of entrepreneurs and smaller firms in these regions of the world. The rationale for choosing this sampling frame is simple: despite medium-sized firms' small share of the total firm distribution, they employ very large shares of the population in developing countries, and thus they represent a substantial and important share of the national economies and labour markets. Thus, to the extent that the aim of the WMS initiative is to understand whether poor management is holding back innovation and productivity growth in low-income countries, it becomes relevant to focus on the industrial activity of medium-sized firms.

Up to 2013, while the countries surveyed were primarily developed countries and large emerging economies like Brazil and India, the sample of firms drawn from Orbis and similar sources were firms between 100-5000 employees. Starting in 2013, with the inclusion of African countries and low- and middle-income Asian and Latin American countries, the WMS team moved to include firms with 50-100 employees as well. To ensure we would get a reasonable share of these firms in our final sample, we stratified the sampling frame distributed to the analysts to include 20% of firms in the 50-99 employees range, and the remaining 80% was populated with 100-5000 employee firms. To be sure, we first built the sampling frame from lists of available establishments and then extracted this stratified random sample.

To ensure the collection of accurate responses, the WMS project hires students and young professionals from top universities in the UK who generally have had some business experience and whose native language was the same as the country they were hired to survey. The majority of interviews were conducted from a central location - the Centre for Economic Performance at the London School of Economics in order to harmonize cross-country data comparison. The authors of this report have trained and overseen all waves of data collection since 2008, including the developing countries discussed in detail here, with only a few exceptions.³ In particular, all interviewers have the same initial training and attend weekly meetings to collectively discuss interviews and compare scores. Finally, in order to address concerns over inconsistent interpretation of categorical responses,⁴ interviewer fixed effects are be

³Exceptions to this were the waves prior to 2008 and the manufacturing surveys for Australia and New Zealand and Singapore, where Rebecca Homkes took on the training and supervision of the teams.

⁴Manski (2004)

removed from all empirical specifications, thus standardizing the scoring system. As an additional control for any potential survey noise, detailed information on the interview process itself and on the interviewee is collected to help control for measurement error.

2.1.1 Measuring management

In 2002, a leading consulting company along with Nicholas Bloom and John Van Reenen developed a survey tool to systematically measure the quality of management practices in manufacturing establishments. It uses an interview-based evaluation tool that defines and scores a set of 18 basic management practices from one (“worst practice”) to five (“best practice”).⁵ Previous studies have found that management practices - defined in terms of monitoring, targets and incentives - are robustly linked to firm and national performance. In short, these studies find that, on average, better managed manufacturing firms have higher productivity (as measured by sales per employee, Tobin’s Q, and ROCE), better managed retail stores have higher sales per employee performance, better managed hospitals have lower risk-adjusted heart attack mortality rates, and better managed schools have higher standardized test scores.⁶ Past research with the WMS data shows that improving management practices is a highly leveraged means of getting more output from firms existing labour and capital. A simple correlation between the country-level aggregated management measure and the log of GDP (in PPP per capita) shows that the measure does indeed

⁵For more information and for the full survey grid for manufacturing, see www.worldmanagementsurvey.org

⁶Bloom & Van Reenen (2007), Bloom, Van Reenen & Sadun (2012)

hold some information about country productivity (Figure 1).

Of course, there is not enough evidence strictly from the WMS to claim a causal relationship yet and we can only provide a rich set of descriptive statistics, but the results are indicative that this is an interesting area to study. One claim of causality that this body of research can make comes from a recent field experiment on 28 large Indian textile factories.⁷ Free management consulting was provided to a set of randomly selected treatment plants to help them adopt modern management practices and compared their performance to another randomly chosen set of control. This experiment revealed that the adoption of these management practices for monitoring, targets, and incentives was significant, leading to an average increase in productivity of 18%.⁸

A high score in the WMS scale represents a best practice in the sense that an establishment that adopts the practice will, on average, improve their performance. The combination of many of these indicators reflects good management as commonly understood, and the main measure of management practices represents the average of scores across 18 management “topics.”

⁷Bloom et al. (2013)

⁸Considering the broader literature on management and productivity, Ichniowski et al. (1997) document higher levels of productivity associated with using sets of modern or innovative practices instead of traditional practices. They also find that clusters of complementary human resource management practices have large and positive effects on productivity, while individual work practices show little to no effect on productivity. Black & Lynch (2001) also find similar results when estimating a standard Cobb-Douglas production function with cross-sectional data in the US. More importantly, they find that the manner in which a practice is implemented is more important for the productivity effect than whether the practice is said to be used or not. Bertrand & Schoar (2003) use a panel of manager-firm matched data to isolate the manager fixed effects and find that there are significant patterns that indicate management style is related to manager fixed effects in performance, who in turn are more likely to be in better managed firms.

This evaluation tool can be interpreted as attempting to measure management practices in four broad areas:

1. *Lean operations* in schools covers topics measuring whether the manufacturing plant has implemented lean manufacturing (modern) production processes including (but not limited to) 5S, kaizen, kanban and calculating takt time. Further, it also measures the rationale for introducing changes into the production process, and considers whether the firm was “behind the times” attempting to catch up to competitors, whether it is simply implementing changes for cost-cutting purposes or whether it is part of a more holistic approach to a culture change in the organization.
2. *Monitoring management* covers topics of continuous improvement, performance tracking, review and dialogue, and consequence management. It measures whether the plant has processes towards continuous improvement and lessons are captured and documented, whether plant performance is regularly tracked with useful metrics, reviewed with appropriate frequency, quality, and follow-up, and communicated to staff.
3. *Target management* covers topics in the balance and interconnection of targets, the time-horizon and difficulty of the targets, as well as their clarity and comparability. It measures whether the firm, plant, and individual targets cover a sufficiently broad set of metrics; whether these targets are aligned with each other and the overall goals.
4. *People management* covers topics in handling good and bad performance, mea-

asuring whether there is a systematic approach to identifying good and bad performance, rewarding employees proportionately, dealing with underperformers, and promoting and retaining good performers.

2.1.2 Measuring work-life balance

The work-life balance questions measured in the survey were first used by Bloom et al. (2010) and combined concepts that were previously used in other surveys such as the UK Workplace Employment Relations Survey (WERS). The WMS questions focus on “voluntary family-friendly workplace practices,” to minimize the influence of different regulatory regimes on provision of such practices. Along with more straightforward measures, the original survey in Bloom et al. (2010) also asked: ‘Relative to other companies in your industry, how much does your company emphasize work-life balance’ and scored it as: much less (1); slightly less (2); the same (3); slightly more (4); much more (5). They did this to validate the practices measured subsequently, in that the practices are indeed effective in terms of improving perceived employee work-life balance. The correlation of this response with the other measured practices suggests the practices are indeed informative despite being a measure of supply of the workplace practices as a decision variable by firms rather than actual take-up.

The family-friendly workplace practices measured in the WMS are as follows. First, the WMS asks whether managers and/or non-managers have the ability to switch to part-time work if they need to. Second, it asks whether they are able to take a day off in an emergency (such as to care for a sick child). Third, it asks whether

the managers have the ability to request to work from home a certain number of days per week, and how many days they could work from home per week. The same question is asked of non-managers. Fourth, there is a question on how much mothers can expect of maternity leave as managers and as non-managers. Finally, there is also a question on the average number of holiday days per year.

2.1.3 Measuring human capital

Beyond the data on the quality of people management practices, the WMS collects a set of basic statistics of the make-up of the labour force in each firm. The data collected includes labour shares in managerial positions and the aggregate education levels of the employees, including: % managers in the plant, % female employees (managers and non-managers) in the plant, % managers with a college degree (and also the share with a STEM degree), % non-managers with a college degree (and share with a STEM degree), % managers with an MBA. To ensure the shares are accurate, the WMS analysts are instructed to ask first for the total number of employees in the firm and in the plant, and subsequently ask for number of employees who are managers, who have degrees etc. The shares are generally then calculated ex-post.

To understand the work-week of managers and non-managers, the WMS also asks for the average number of hours worked by a manager and a non-manager in a typical week. Finally, there are also questions about the share of workers who are unionized to measure worker bargaining power, and also the share of managers who have left

in the past 12 months to measure retention rates.

2.1.4 Measuring decentralization

To measure decentralization, the WMS asks a series of questions. First, there is a question on the hiring autonomy of the plant manager, relating to how easy it is for the plant manager to hire a new full time worker. A score of 1 means it is entirely within the plant manager's authority to hire a new full time worker, and a 5 means it is entirely out of their hands. A score of 3 implies it is a joint decision between the plant manager and the owner/central HR, but that requests from the plant manager are generally agreed to the majority of the time. Second, the manager is asked about their autonomy in sales and marketing, with the same grid of scoring responses. Third, there is a question about the degree of autonomy of the plant manager in terms of new product introduction into the production line, again with the same scoring guidelines. The final question in this section inquires about the maximum capital investment the plant manager could make without getting prior approval from the owner/central headquarters. This is generally a misunderstood question as many managers will say they have zero autonomy, but we qualify the statement with an example of the purchase of, say, a new computer and ask again whether they would be able to do make such a purchase without prior authorization. At this point many will then revise their answer and give us a maximum amount that they could spend on such purchases.

A second set of questions relates to the hierarchy and span of control of plant man-

agers. We collect data on the levels of hierarchy between the shopfloor worker and the plant manager and the shopfloor worker and the CEO. The interviewers are instructed to ask the question in the following manner: “If I were a shopfloor worker, who would I report to?” and following the answer from the manager they then continue with “and who would they report to?” until they reach the level of the CEO/Board of Directors. They then count the layers between the levels, excluding the lowest and highest. For example, a shopfloor to CEO hierarchy that starts with the shopfloor worker, who reports to their supervisor, who reports to the plant manager, who reports to the VP who then reports to the CEO has a value of 3. The WMS also asks the number of direct reports to the plant manager and to the CEO to measure span of control.

2.1.5 Measuring infrastructure

Following similar questions to the World Bank’s World Enterprise Survey, the WMS started collecting data on infrastructure available to the establishment in the public sector Indian wave of 2012 and continued to do so for the subsequent waves that surveyed developing countries. The questions included in the WMS covered the number and extent of power outages (number of outages in the past three months and how long they typically lasted for), the availability of generator power and how long it was typically used for while the regular power source was out. Another set of questions inquired as to the distance and name of the closest major highway, the distance and name of the closest railway station, and the distance to the closest bank branch and police station.

Considering the prevalence of mobile payments in African countries, we also collected data on the use of mobile payments in firms to compare the extent of usage of this alternative banking method in industries across countries. We asked a set of yes/no questions that include whether the manager used mobile banking for deposits, withdrawals, transfers or any sort of payments for the firm and the average amount of such transactions via mobile banking.

3 A picture of firms in developing countries and emerging economies

As mentioned in the introduction, research using the WMS management measures finds that it is strongly correlated with GDP, confirming that the management measure is economically meaningful (Figure 1). Second, there are also large variations in management quality in operations, monitoring, targets and incentive practices across countries. Firms in low income countries have much worse management practices - defined in terms of more effective monitoring, targets and incentives - than firms in middle and high income countries (Figure 2). Moreover, the low average management quality in middle- and low-income countries appears to be due primarily to a large share of badly managed firms. Figure 3 shows the distribution of scores of firms in each of the middle- and low-income countries surveyed from Africa, Asia and Latin America, along with the kernel density of the average management score leader, the United States, as a comparison. Notably, Ghana and Ethiopia have quite

narrow distributions; while Kenya and Mozambique have slightly more dispersed distributions with some (albeit very few) firms reaching upper 3s-low 4s average scores. Most Asian and Latin American countries have fairly wide distributions, suggesting that good management is not necessarily a primarily western concept that cannot be applied elsewhere, as some firms are clearly able to do apply them successfully.

Turning to descriptive statistics of firm characteristics, we first show the median age of the plants interviewed in Figure 4. On average we find that, out of the firms we interviewed, African firms are (perhaps unsurprisingly) the youngest among our sample of countries. The median (mean) age of a plant in Africa is 20 (26), in Asia is 22 (28), in Oceania is 40 (50), in Europe is 35 (47), in Latin America is 34 (39) and in North America is 40 (50). In terms of size, we report here the average number of employees at the plant across the countries in the WMS sample. African plants are the second smallest in this sample with a median (mean) size of 106 (209). Latin American plants are the largest with a median (mean) of 180 (286), while European and North American plants have the same median of 140 employees and only slightly different means (211 for Europe and 2012 for North America). Asian plants have a median (mean) of 134 (267) employees and plants in Oceania are the smallest, with a median (mean) of 99 (148) employees. Figure 5 shows the median number of employees in firms across the countries in our WMS sample.⁹ In the WMS, papers generally find that firm size is positively correlated with management quality.¹⁰

Figures 6, 7, 8 show the share of firms in our sample in each ownership category

⁹The figure here excludes China.

¹⁰See, for example, Bloom et al. (2014).

we track for each continental region. In the WMS, dispersed shareholders would be firms where no one entity owns more than 25% of the shares. Private individuals would be when at least one person owns more than 25% and they are not members of the founding family. Founder owned, founder CEO refers to firms still owned and controlled by the founder him/herself, and family owned, family CEO strictly refers to firms still in the ownership and control of descendants of the *founding family*. Family owned, professional CEO refers to firms that are owned by the founder or founding family, but control rests on the hands of a non-family CEO.¹¹

In the overall results of the WMS we have found that ownership structure is strongly correlated with quality of management - particularly founder and family ownership. Lemos & Scur (2015) uses a new dataset on ownership and control of firms in the WMS sample to show evidence suggestive of a causal negative relationship between family (second generation onwards) control and quality of management. Looking at the snapshots in this report, it looks like the most common ownership type the African countries we have surveyed is founder-owned, with private firms a close second followed by family-owned (that is, having had at least one succession from founder to family 2nd generation onwards) and dispersed shareholders. In Asia we find a substantially larger share of dispersed shareholder firms, particularly in Japan and Singapore. Myanmar, India and Vietnam have large shares of firms owned and controlled by founders. Latin America, interestingly, has fairly similar shares of firms owned and controlled by families and, to a lesser extent, similar shares of founder

¹¹Although, of course, we understand that several family CEOs are “professional” in the sense that they may have the same qualifications as a non-family CEO, we use the term to mean professional without any family relation.

owned and controlled firms (possibly with the exception of Colombia).

Throughout the three graphs, however, it is noteworthy that the US has the smallest share of founder/family owned and controlled firms, while the European average is second lowest when compared to Africa and Latin America, but China and Singapore come in slightly under in the Asia comparison.

Figure 9 shows the work-life balance index for managers and non-managers across the three continental regions we discuss in this report. The index is an average of the z-scores of the six questions relating to “family friendly workplace practices” and includes: flexibility for emergency time off (such as to care for a sick child), ability to switch between part time and full time, share of part time workers in the firm, ability to work from home, number of holiday days in a year and average hours worked per week. Interested readers can find more information on the measure itself and a substantive analysis in Bloom et al. (2010).

Figure 10 shows the share of employees with a college degree across all countries surveyed. Japan has the highest share of employees with college degrees, while Tanzania has the lowest. Interestingly, the middle of the rank is populated mainly by European countries, while African, Asian and Latin American countries seem rather polarized and fall at either end of the ranking. It is noteworthy that this variable does not measure the quality of the college degree received by the employees, but rather it documents shares of the workforce with any type of college degree. Interested readers can be referred to Lemos (2015), where she uses the WMS data combined with an external employee information dataset to analyze the importance of the quality of

the schools attended by the employees for firm management and finds a positive relationship.

Figure 11 shows the index built from four autonomy-related questions in the WMS. Each question relating to the plant manager's autonomy on hiring/firing, maximum capital investment, sales and marketing and new product introductions is standardized, then we take the average of these standardized values and standardize it again to create the index.¹² Sweden and Canada top the decentralization ranking, while nearly all Asian countries (with the notable exception of Singapore) make up the most centralized countries in the ranking. European countries are dispersed throughout the ranking, while Latin Americans are the second most centralized and Anglo-saxons in North America and Oceania are relatively more decentralized than the average. Interested readers should refer to Bloom, Sadun & Van Reenen (2012).

Finally, Table 1 presents the preliminary evidence we collected from African firms and their usage of mobile banking *for the firm*. On average, the firms in our sample do not seem to use mobile banking for firm-based transactions.¹³ This is not too surprising considering these are all firms with 50+ employees, but it is plausible that perhaps their customers or suppliers would be smaller firms and might use this type of banking. Interestingly, Kenyan firms are the outliers and report using mobile banking for a fifth of firm transfers, and about 10% of firm payments. Ethiopia, on the other hand, is the only country where no firms reported using mobile banking at all. In terms of the remaining infrastructure measures, we are cleaning the infrastructure

¹²The African data is missing from this graph because it is currently being verified.

¹³We specifically asked questions about usage of mobile banking *for the firm* and did not ask questions about personal use.

data collected for African and Latin American countries and also procuring external datasets, such as those from the Earth Institute, and will include summary statistics in a later draft.

4 Concluding remarks

In this report, we provide a detailed account of the data collection process used in the World Management Survey. Such level of detail is often not published in journals where the data is used, but it could be useful for researchers outside of the core research team looking to use the data. More generally, we learned a great deal about building sampling frames and data collection in developing countries that might be useful and transferable lessons to researchers looking to brave this new world in their own field work. In the spirit of not duplicating work, we hope this can be instructive.

More broadly, we use the unique WMS dataset designed to evaluate the quality of management practices in firms across countries and use the management data along with the rich set of descriptive statistics to present a snapshot of manufacturing firms in these countries all in one place for quick reference and cross-checking when using the data.

In our attempt to expand the data collection to developing countries, particularly in the public sector, we have come up against a few obstacles. Building of sampling frames is one of them, but another, possibly more crucial, is the need for highly

skilled interviewers to schedule and conduct the interviews. To tackle some of these issues, we have developed an “extended WMS” for schools and hospitals and detail the development and preliminary findings in Lemos & Scur (n.d.). We hope this report has been instructive for those looking to use the WMS or develop their own survey, and welcome comments and suggestions for future drafts.

Figures

Figure 1: Level of development and management: the WMS measure is informative

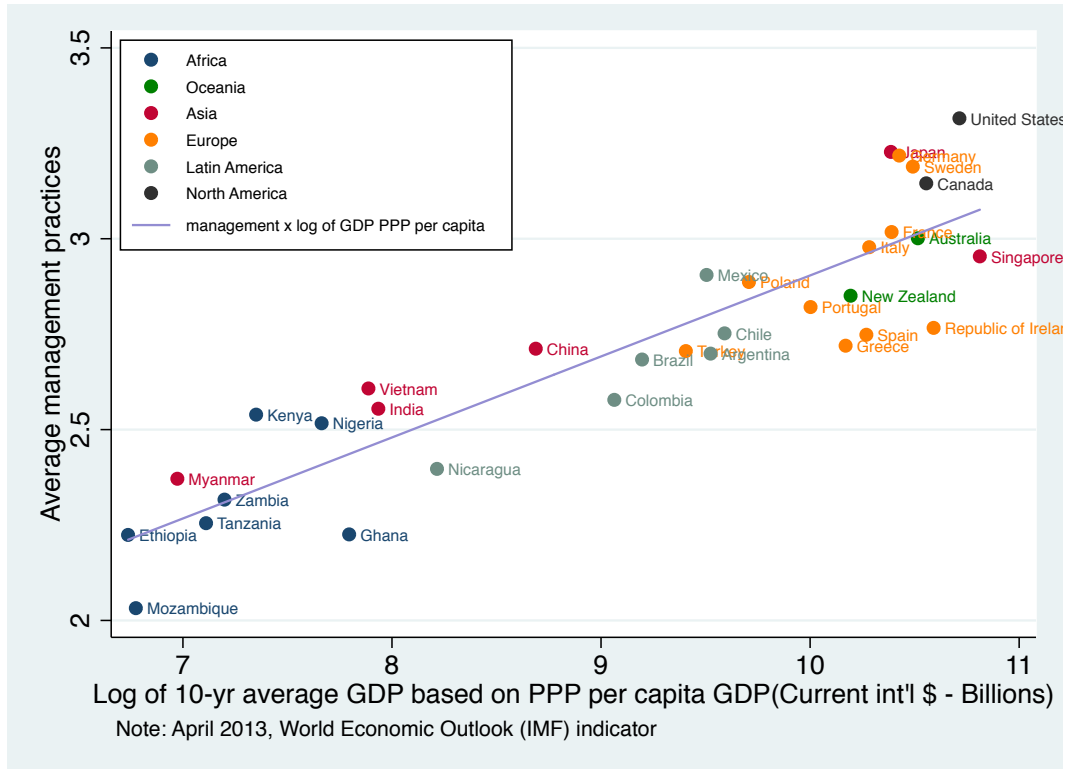


Figure 2: Ranking of management scores across countries

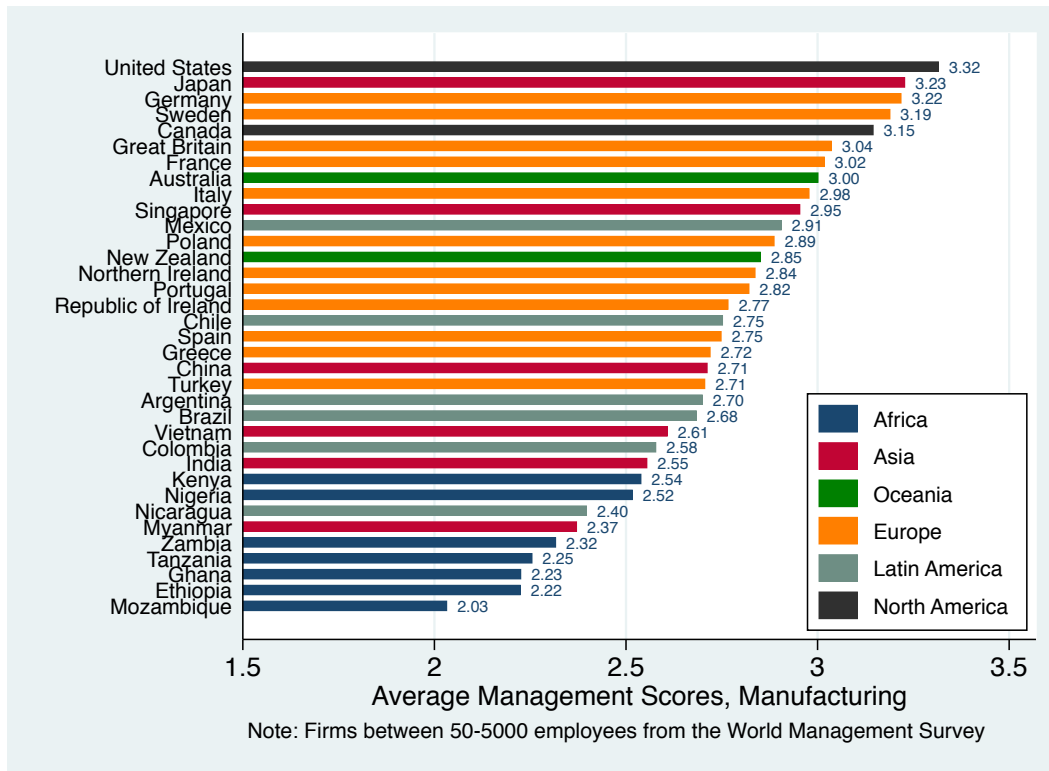


Figure 3: Distribution of scores show there is a long tail of badly managed firms in developing countries

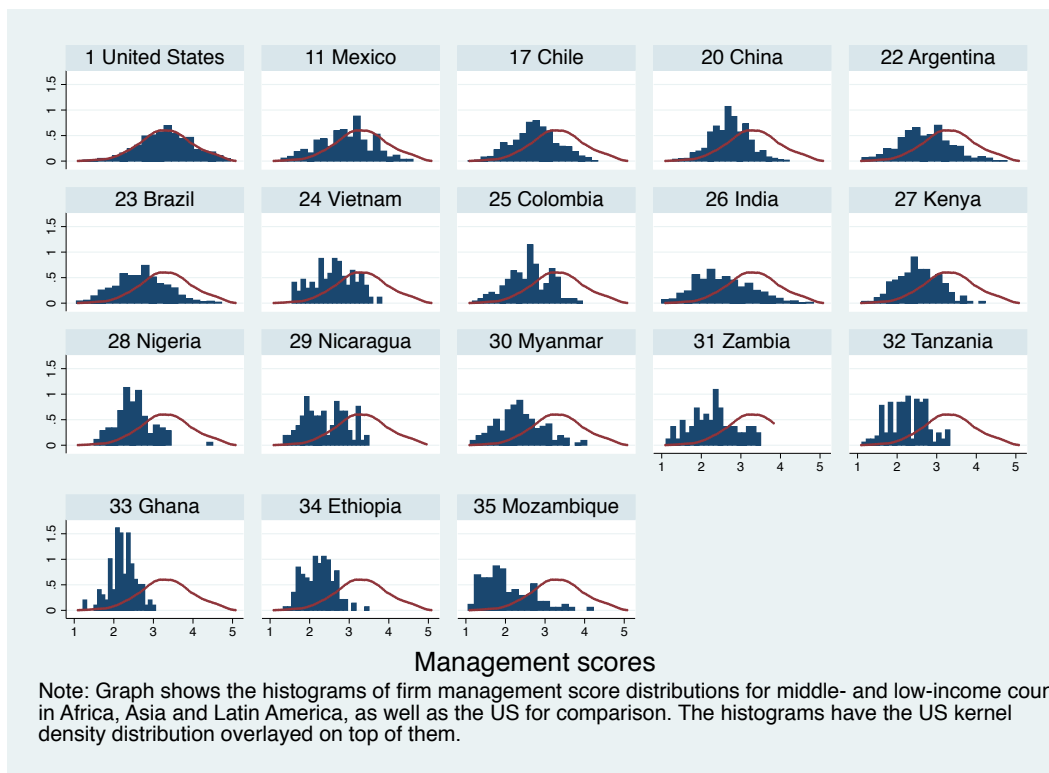


Figure 4: Median firm age across countries

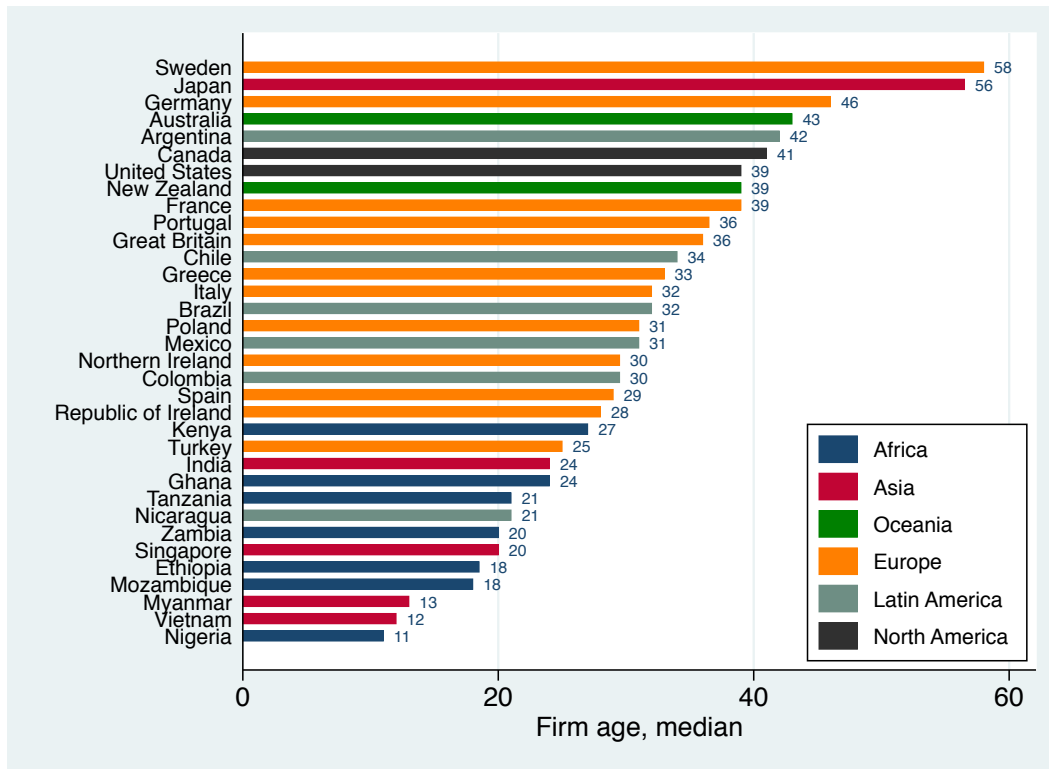


Figure 5: Median firm size across countries

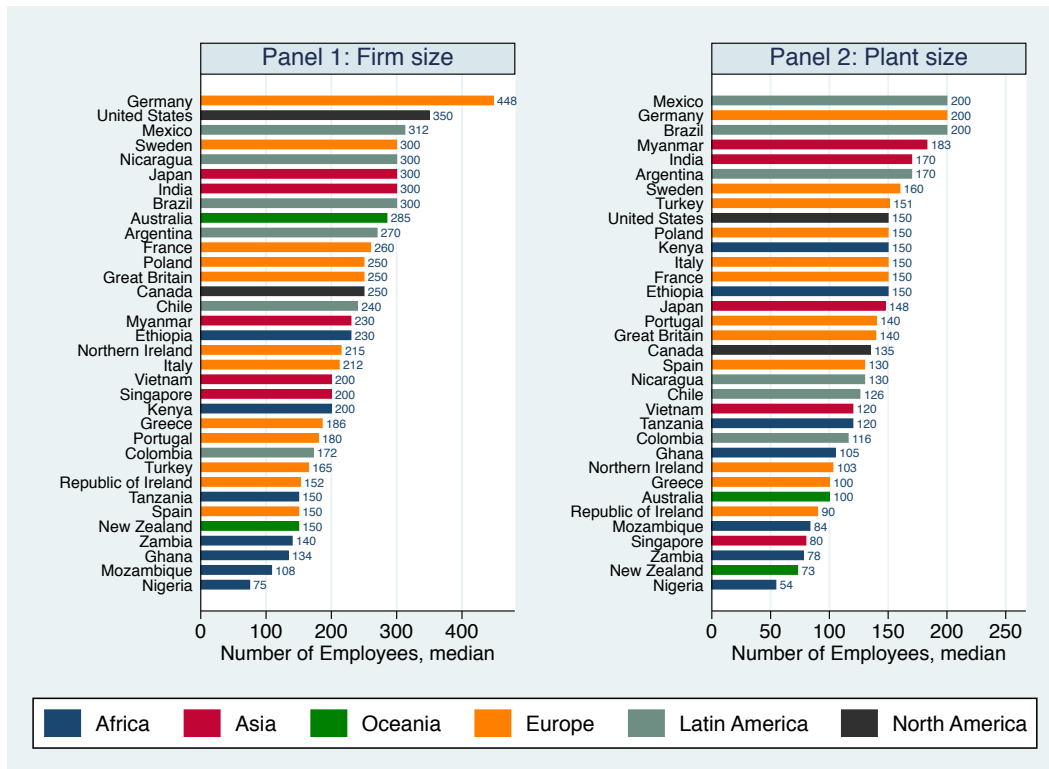


Figure 6: Ownership and control of firms, Africa, by country

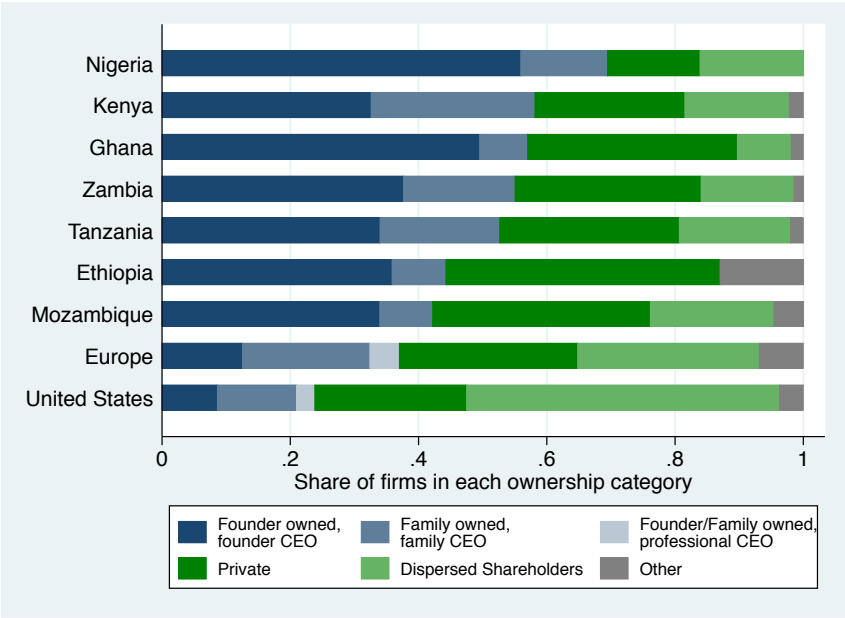


Figure 7: Ownership and control of firms, Asia, by country

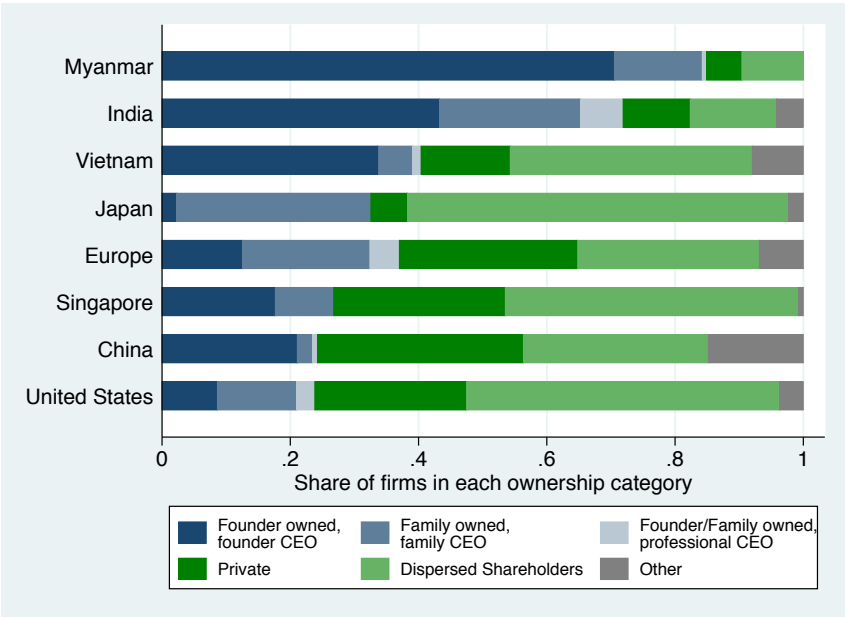


Figure 8: Ownership and control of firms, Latin America, by country

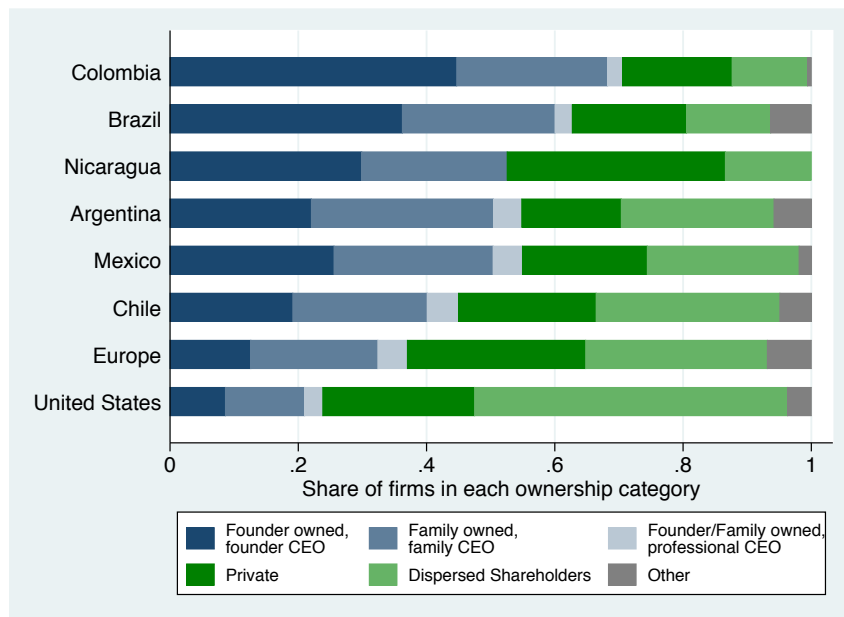


Figure 9: Work-life balance, managers and non-managers

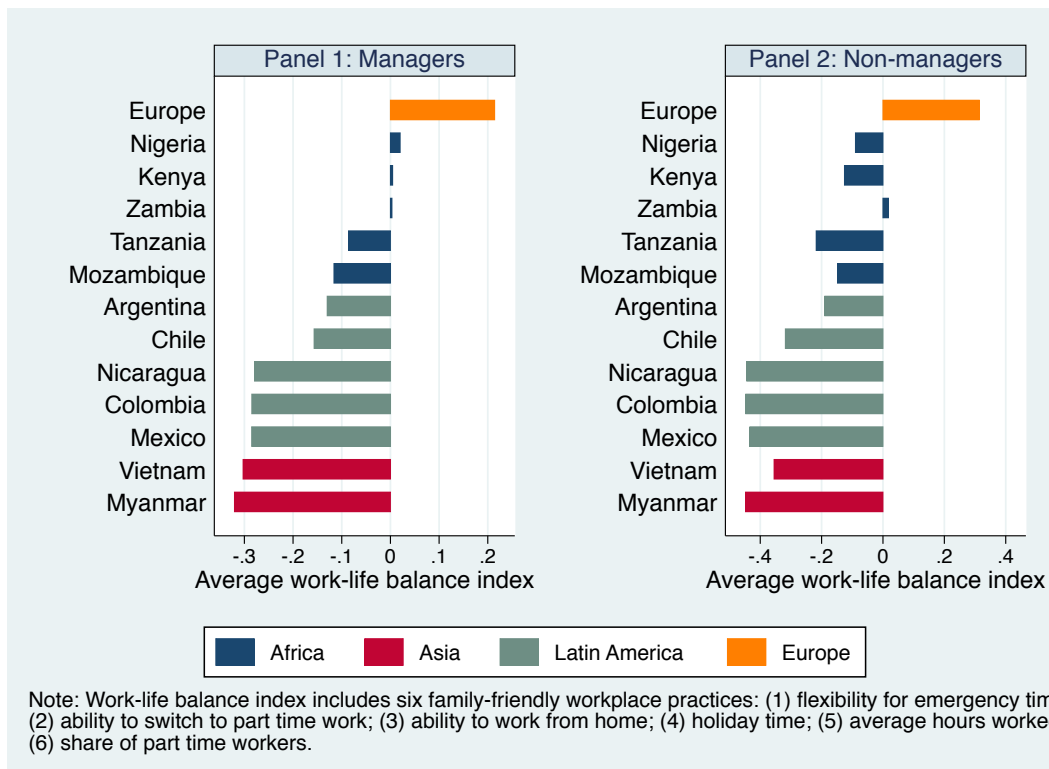


Figure 10: Share of employees with a college degree

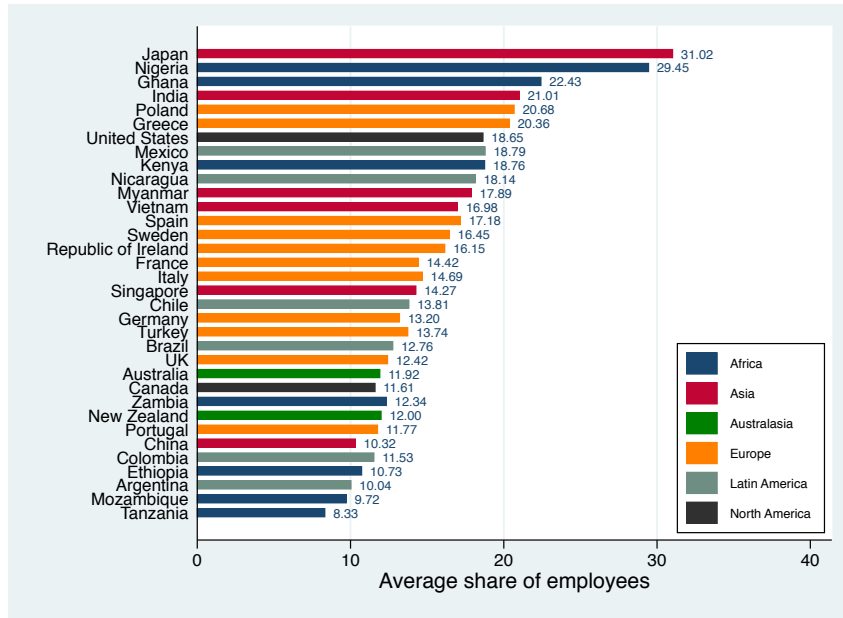
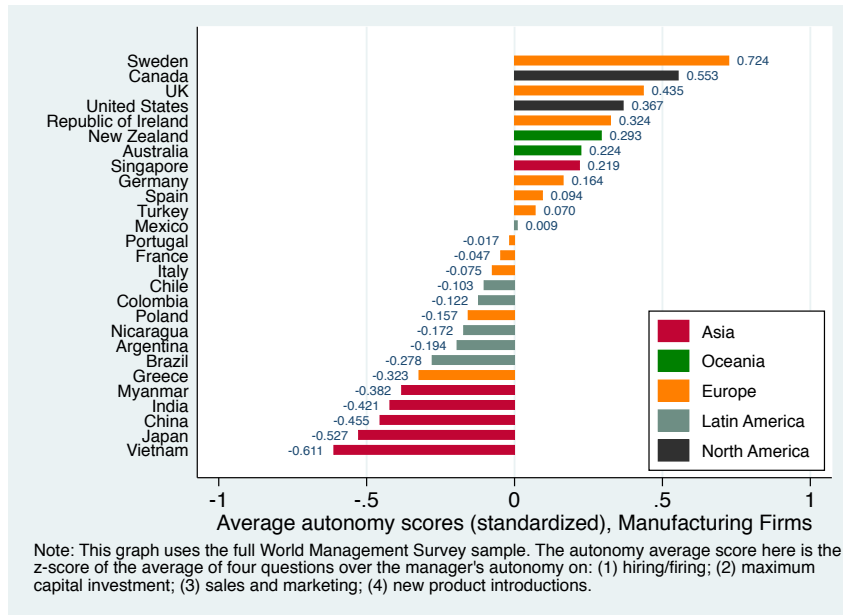


Figure 11: Firms in Asia and Latin America are more centralized



Tables

Table 1: Usage of mobile banking by African firms

Country	Deposits	Withdrawals	Transfers	Payments	Airtime
Ethiopia	0.00%	0.00%	0.00%	0.00%	0.00%
Ghana	0.93%	0.00%	2.78%	0.00%	0.00%
Kenya	10.81%	7.03%	20.54%	10.27%	4.86%
Mozambique	0.92%	0.00%	2.75%	2.75%	0.00%
Nigeria	0.00%	0.00%	1.69%	2.54%	0.85%
Tanzania	4.00%	2.67%	7.33%	4.00%	2.00%
Zambia	2.94%	1.47%	7.35%	1.47%	1.47%
Average	2.80%	1.59%	6.06%	3.01%	1.31%

Appendices

A Sampling Frame: general WMS

The sampling frame from the World Management Survey waves comes from several sources. We provide the sampling frame construction details for Africa and the public sector Indian wave below, and summarize the sources for the remaining waves here. Bureau van Dijk was the primary source of the sampling frame for the following countries: Argentina, Australia, Brazil, Canada, Mexico, New Zealand and Vietnam from Orbis, China and Japan from Oriana, Spain, France, Great Britain, Germany, Greece, Ireland, Italy, Northern Ireland, Poland, Portugal, Sweden, Turkey from Amadeus and United States from Icarus. We also included firms from Compustat in the US sampling frame. Data for Chile came from the annual industrial census, Encuesta Nacional Industrial Anual (ENIA). Data for Colombia came from Supersociedades.¹⁴ Data for India came from CMIE Firstsource. Data for Singapore was sourced by the Singaporean Ministry of Trade and Industry. Data for Myanmar came from the Myanmar Enterprise Map, a separate project funded by PEDL and led by Renata Lemos and coauthors.¹⁵

¹⁴This database was kindly provided to the project by Marcela Eslava.

¹⁵Bloom et al. (2015), more information at: <http://pedl.cepr.org/content/registry-data-burma-mapping-country%E2%80%99s-manufacturing-industry-and-related-infrastructure-0>

B Sampling Frame construction: Africa

The sampling frame for the African countries was constructed using several online sources. Some countries' sampling frames were significantly easier to build than others due to variances in the level and quality of information available online and to the assistance provided by different entities contacted. This resulted in discrepancies in the size and quality of the sampling frames.

The sampling frame was a mix of data from several sources including John Sutton's IGC Enterprise Maps, lists available online (or provided by email) by several manufacturing and trade entities and BvD Orbis. Several online business directories were also used to find company names, as well as company contact details for those companies found in other sources. We now detail each country's data sources.

B.1 Ethiopia

For the sampling frame of Ethiopia we used John Sutton's Enterprise Map of Ethiopia and purchased an updated sampling frame from Sutton's co-author, Nebil Kellow.

B.2 Ghana

The Ghana sampling frame was made up of 379 companies and 413 plants and was primarily built on the basis provided by:

- **John Sutton's Enterprise Map of Ghana:**¹⁶ This is a paper published by the International Growth Centre (IGC) in 2012 which aims to provide a standardised description of Ghana's current industrial capabilities. The examples of key companies provided for each industry were included in the sampling frame. Background information on these companies generally did not allow us to determine whether they were eligible for the project. 295 companies mentioned in the Enterprise Map were included in the sampling frame.
- **Bureau van Dijk, Orbis:** Orbis provides financial information on listed and unlisted companies worldwide. 295 Ghanaian companies with more than 50

¹⁶Available at: http://personal.lse.ac.uk/sutton/ghana_final_checks.pdf

employees are currently listed on Orbis. Some additional relevant information, such as parent company was available. The last available date for information available varied, with some companies' information dating back to 2003 and the most recent information available dating to 2011. Of these 295 companies, 112 companies were included in the sampling frame.

- **Ghana Free Zones Board:**¹⁷ The GFZB is a government agency responsible for implementing free economic zones and promoting economic development in Ghana. The agency's website provides a list of 299 GFZB enterprises, covering all sectors including manufacturing. The GFZB was contacted to enquire about a list of manufacturing companies in the Free Zones and although a positive response was received, we were not provided with any significant assistance. Due to the layout of the website, the list provided online was only used to cross check companies and verify whether they were in the manufacturing sector.
- **Business Ghana:**¹⁸ 301 companies in the Ghana sampling frame were taken from this online business directory. Company names and contact information were found for companies by searching within the manufacturing category. It was later found that many of the numbers provided by Business Ghana were outdated, not in use or incorrect.
- **Ghana Web:**¹⁹ A business directory, this was used to find contacts for the companies found in the Enterprise Map and Orbis. This directory was not used to find company names as the majority of companies were duplicates of those we already had, and were in general not categorised by industry.

Several entities were contacted by email and telephone to enquire about existing business directories and lists of manufacturing companies. Entities contacted include:

- Ghana Free Trade Zones Board (GFTZ Board)
- Sekondi-Takoradi Regional Chamber of Commerce and Industry (G)
- UNIDO Ghana
- Ghana Trades Union Congress
- Industrial Research Institute

¹⁷ Available at: <http://www.gfzb.gov.gh/gfzb%20enterprises/index.php>

¹⁸ Available at: <http://www.businessghana.com/portal/directory/>

¹⁹ Available at: http://www.ghanaweb.com/GhanaHomePage/telephone_directory/

- Ghana Investment Promotion Centre (GIPC)
- Association of Ghana Industries (AGI)
- Ghana Ministry of Trade and Industry
- Registrar General's Department
- Ghana Commerce
- Private Enterprise Foundation (PEF)
- Ghana Revenue Authority
- Ghana Standards Authority
- Ghana National Chamber of Commerce
- Ghana Statistics Agency

Three of these entities responded (GFTZ Board, Ghana National Chamber of Commerce and Ghana Statistics Agency), but only the GFTZ followed up. The GTFZ requested a letter introducing the project, but once sent we did not receive a response. None of these entities provided any assistance in the construction of the sampling frame.

The process used to construct the sampling frame for Ghana was the following:

1. Extracted company names from the Enterprise Map, Orbis and Business Ghana. Extracted contact information and all other information available from Ghana Web. All other companies were searched on Google, and all contact information and other relevant information were taken down. This yielded a total of 413 entries.
2. The vast majority of companies did not have a website, and many were hard to find online. Information regarding the number of plants, separate plant contact information, the number of employees and the industry category was therefore very difficult to find. For this reason analysts were given companies which we were unable to confirm met the eligibility requirements of the project, which include:
 - (a) Must be a manufacturing company
 - (b) Must have a minimum of 50 employees
3. Eligibility requirements to conduct an interview are as follows:

- (a) Plant Manager must have been in position for a minimum of 1 year
 - (b) If no Plant Manager at the plant, interviewee must hold a position which requires him/her to have full knowledge of the day-to-day running of the plant
4. At the start of the project 2 analysts were given an equal number of Ghanaian companies to call.
 5. In week 2 of the project one of the Ghana analysts left, so all 379 Ghanaian companies were given to one analyst. To eliminate interviewer bias for Ghana, all interviews conducted by this analyst were to be double scored by a manager.

Of the 424 companies found, we were unable to find a contact for 45 of them (although a significant number of the numbers we did find were later found to be invalid, outdated or not in use).

B.3 Kenya

The Kenya sampling frame was built using 2 sources: Orbis and a list of manufacturing companies provided by the Kenya Association of Manufacturers (KAM). The total number of companies in this sampling frame was 822, and the total number of plants 846.

- **Kenya Association of Manufacturers:**²⁰ The KAM is an organisation which represents the interests of manufacturing and value-added industry companies in Kenya. We were provided with the list of member companies, which currently totals 619. These companies represent approximately 60% of value-added industry companies in Kenya, however the KAM representative who assisted us considered it a fair representation of the industry given that most medium and large companies hold membership of this association.
- **Bureau van Dijk, Orbis:** Orbis is a database that provides financial information on listed and unlisted companies worldwide. 432 Kenyan companies with more than 50 employees or with no data on the number of employees are currently listed on Orbis. Some additional relevant information, such as parent company was available. The last available date for information available varied, with some companies' information dating back to 2003 and the most recent infor-

²⁰ Available at: <http://www.kam.co.ke/>

mation available dating to 2012. Of these 432 companies, 317 companies (337 plants) were included in the sampling frame.

Several entities were contacted by email and telephone to enquire about existing business directories and lists of manufacturing companies. Apart from the assistance received from the KAM, no other responses were received. Entities contacted include:

- Kenya National Chamber of Commerce and Industry
- East African Community
- UNIDO Kenya
- COMESA
- Kenyan Embassy UK
- ESAMI Kenya
- Kenya Association of Manufacturers
- Kenya Industrial Research and Development Institute (KIRDI)
- British High Commission Nairobi
- Intergovernmental Authority on Development (IGAD)

The process used to construct the sampling frame for Kenya was the following:

1. Extracted company names from both sources. No contact information provided for any of the companies. Companies were searched on Google, and online directories such as Kenya's Yellow Pages and Kenyan Kenya among many others were used to find numbers. At the start of the project 107 company numbers had been found.
2. The vast majority of companies did not have a website, and many were hard to find online. Information regarding the number of plants, separate plant contact information and the number of employees was therefore difficult to find. Similarly, apart from contact details and manufacturing status no other relevant information was provided by the above sources. For this reason analysts were given companies which we were unable to confirm met the eligibility requirements of the project, which include:
 - (a) Must be a manufacturing company

- (b) Must have a minimum of 50 employees
3. Eligibility requirements to conduct an interview are as follows:
- (a) Plant Manager must have been in position for a minimum of 1 year
 - (b) If no Plant Manager at the plant, interviewee must hold a position which requires him/her to have full knowledge of the day-to-day running of the plant
4. At the start of the project 146 companies were given to one analyst. In the following weeks, given the difficulties encountered with the Zambian sampling frame, as well as a language barrier for a non-Swahili speaking analyst working with Tanzania, numbers were searched for more of the Kenyan companies, and 75 companies were distributed to these 3 analysts.

Because the list of companies for Kenya is so large, many of them have not been searched or distributed to analysts.

B.4 Mozambique

The sampling frame for the Mozambique countries was built using several online sources and documents that were sent to us by different entities. The sampling frame was a mix of data from several sources including a list from the Ministry of Commerce and Industry. Several online business directories were also used to find company names, as well as contact details for those companies found in other sources.

The Mozambique sampling frame was made up of 239 companies in total. The sampling frame was primarily built on the basis provided by:

- **100 melhores Pequenas e Medias Empresas:**²¹ This is a Facebook page of an annual event show-casing existing small and medium-sized companies in Mozambique. All 100 companies were included in the sampling frame. Background information on these companies generally did not allow us to determine whether they were eligible for the project. Information provided included company name, telephone number and address.
- **Camara de Comercio Portugal e Mocambique:**²² This is an Association

²¹ Available at: <https://www.facebook.com/100MelhoresPME?ref=stream>

²² Available at: <http://www.ccpm.pt/associados.php>

of Portuguese and Mozambican companies. The 159 companies were found, but no contact details were provided. In some cases company websites were listed. Background information on these companies generally did not allow us to determine their eligibility for the project.

- **Facim 2010²³ and Facim 2013:²⁴** Facim is an annual event showcasing companies which takes place in Maputo. The 2010 and 2013 lists of companies represented at the event were available online. The 2010 list had 198 companies in total. Activity, address and contact number were available for most companies. The 2013 list had 286 companies in total. Activity, address and contact number were available for most companies.
- **Mozambique Exporters Directory:²⁵** This is a list of 207 companies published online by the Institute for the Promotion of Exporters. Background information on these companies was available, including address, activity and telephone number. Background information on these companies generally did not allow us to determine eligibility for the project.
- **Acismoz:²⁶** This is a Mozambican not-for-profit association, with over 300 member companies. Members are from major sectors of the Mozambican economy including mining, hydrocarbons, agriculture, transport and logistics, telecommunications, forestry, FMCGs, retail, manufacturing and service provision. Put of the 300 companies, 31 were eligible and included in the sampling frame. Information including address, activity and telephone number were available. Background information on these companies generally did not allow us to determine eligibility for the project.
- **Base de Dados de Interesses Empresariais:²⁷** This is a public database which aims to map the economic interests of the Mozambican political elite. 63 companies from this database were found to be in manufacturing (listed by activity). Contact numbers were not available and background information on these companies generally did not allow us to determine companies' eligibility for the project.
- **Beluluane Industrial Park:** This is an industrial park based in Maputo.

²³Available at: <http://www.facimfair.co.mz/facim/CatalogoFACIM2010.pdf>

²⁴Available at: http://spicsolutions.com/facim/ficheiros/9/AfBrochura_atrocinadores_15x21-spread.pdf

²⁵http://www.ipexmz.com/pdfs/exporters_directory2009-november.pdf

²⁶www.acismoz.com

²⁷Available at: <http://www.cip.org.mz/cipsrddb/index.asp?src=srca>

The park was contacted and a list with all 43 companies based in the park was sent by email by the Director. Background information on these companies was available, including activity and telephone.

- **Direcao Nacional de Industrias de Mocambique:** This is a department of the Ministry of Commerce and Industry of Mozambique. A list of 1091 companies was acquired from them. Company information included activity, products, address and district, fiscal identification number, charter number, telephone, e-mail, license data, license type, dimension, investment, raw material, raw material subsidised, production capacity, electrical potency in Kwa.
- **Embassy of the USA in Maputo:**²⁸ 16 American companies operating in Mozambique were found on the US Embassy's website. Company address and telephone number were provided on the website.
- **Gmdu:**²⁹ This is a business directory of Mozambican companies. 21 companies were included in the sampling frame. Background information on the companies generally allowed us to determine whether they were eligible for the project. Address and telephone details were available online.
- **Google maps:** We used google maps to include some more companies in the sampling frame. Searches were made in the main industrial areas of Mozambique, specifically Maputo Tete and Nampula. 54 companies were included. Address information was available for all the companies. Background information on these companies generally did not allow us to determine whether eligibility for the project.
- **Ministerio da Industria e Comercio:**³⁰ This is a list of companies published online by the Mozambican Ministry of Commerce and Industry. 105 companies were found. Background information on these companies generally did not allow us to determine eligibility for the project. Contact details were not available.
- **Mocambique Empresas:**³¹ This is an online business directory of Mozambican companies. 14 companies were included in the sampling frame. Background information on these companies generally did not allow us to determine

²⁸ Available at: http://maputo.usembassy.gov/american_companies_in_mozambique.html

²⁹ <http://www.gmdu.net/loca-138-p1.html>

³⁰ Available at: <http://www.madeinmozambique.gov.mz/>

³¹ Available at: [http://www.mocambiqueempresas.com/index.php?pc=dir_business_atsector_parent_id =](http://www.mocambiqueempresas.com/index.php?pc=dir_business_atsector_parent_id=)

eligibility for the project. Contact details were not available.

- **Mozambique information:**³² This is an online business directory of Mozambican companies. 38 companies included in the sampling frame. Background information on these companies generally did not allow us to determine whether eligibility for the project. Company contact details and address were available.
- **Industrias em MZ:**³³ This is an online business directory of Mozambican companies. 48 companies were included in the sampling frame. Background information on these companies allowed us to determine eligibility for the project. Company contact details and address were available.
- **PONTO24:**³⁴ This is an online business directory of Mozambican companies. 1593 companies were included in the sampling frame. Background information on these companies allowed us to determine eligibility for the project. Company contact details and address were available.
- **Study Report, Ernst Young:**³⁵ This is a report by Ernst Young, listing the best companies in Mozambique. 41 companies were included in the sampling frame. Background information on these companies did not allow us to determine eligibility for the project.
- **Centro de Promocao de Investimentos:**³⁶ This is an online business directory of Mozambican companies. 89 companies were included in the sampling frame. Background information on these companies allowed us to determine whether eligibility for the project. Company contact details and address were available.
- **The Agribusiness Innovation Center of Mozambique**³⁷

The process used to construct the sampling frame for Mozambique was the following:

1. Extracted company names, contact information and all other information available from the sources described above. All the duplicates were eliminated. All other companies were searched on Google, and all contact information and

³² Available at: <http://www.mozambiqueinformation.com>

³³ <http://industriaemmocambique.blogspot.co.uk/>

³⁴ Available at: <https://www.ponto24.co.mz>

³⁵ Available at: <http://www.itie.org.mz/Relatorio.Scoping.Study.071012ultimo.pdf>

³⁶ Available at: <http://www.tourisminvest.org/Mozambique/downloads/tourism%20sector%20background/Sector%20>

³⁷ Available at: https://www.infodev.org/infodev-files/the_agribusiness_innovation_center_of_mozambique_executive_summary.pdf

other relevant information was recorded. This yielded a total of 239 entries.

2. The majority of companies did not have a website, and many were hard to find online. Information regarding the number of plants, separate plant contact information, the number of employees and the industry category was therefore very difficult to find. For this reason analysts were given companies which we were unable to confirm met the eligibility requirements of the project, which include:
 - (a) Must be a manufacturing company
 - (b) Must have a minimum of 50 employees
3. Eligibility requirements to conduct an interview are as follows:
 - (a) Plant Manager must have been in position for a minimum of 1 year
 - (b) If no Plant Manager at the plant, interviewee must hold a position which requires him/her to have full knowledge of the day-to-day running of the plant

B.5 Nigeria

The Nigerian sampling frame was built using VConnect, local search engine and an information service provider company. 2 lists were initially acquired, one containing 25,188 companies and another containing 47,614 establishments in Nigeria. The second of these lists contained contact details for all companies, however the majority of these did not work. Following poor service by NITEL, the principal telecommunications company in Nigeria and until the late 2000s the main provider of fixed line services, the use of cell phones in Nigeria has expanded and mostly replaced fixed lines (which comprised the majority of telephone contact details in our lists). Moreover, NITEL and its mobile arm M-Tel are currently in liquidation, so many existing numbers are in the process of being replaced by a range of emerging telecommunications companies such as GSM or MTM.

- **Fiscal Studies Database:** This list contained the name and address information for 25,188 companies in Nigeria. The first week of the project was dedicated to finding numbers for the companies on this list. All analysts were given a number of companies to search for (2,785 companies in 3 batches), out of which 335 numbers were found. Of these 335 numbers, less than 20 numbers worked.

- **Africa Business Pages:** This list contained the name, contact details (address and telephone number) and category for 47,614 establishments in Nigeria. All establishments were sorted according to their category, and those that could potentially be classified as manufacturing (based on the business category) were selected (2,344 companies). 335 of these companies were distributed to analysts (200 to the full-time analyst and 135 to the part-time analyst). Out of these 335: 35 were manufacturing companies with a working number, 48 were manufacturing companies with less than 50 employees, 49 were not manufacturing and 247 were not reachable. A calling card for Nigeria was purchased to rule out the possibility that we were unable to reach the numbers because we were calling from Skype.
- **VConnect website:**³⁸ This website provides information on local businesses across states and LGAs. The search can be classified as product, service brand, category or business. Following the problems with the previous 2 sources we looked for companies with numbers using this online business directory. We went through each category and sub-category, searching for all companies which were described as 'manufacturing' (there is no 'manufacturing' category), we took down the name and contact details and compiled a list. Once we had around 200 companies we began to call the numbers to verify that 1) the numbers worked, and 2) the companies we were calling were manufacturing. No other eligibility criteria were verified. At present, we have 657 confirmed manufacturing companies and 349 still to verify. 107 have invalid numbers and are unreachable.

Several entities were contacted first by telephone, and then by email (initial email sent 14 January 2014, official request sent on the 5 March 2014). All entities were sent a signed letter requesting assistance on acquiring information of manufacturers in Nigeria. So far, no responses have been received. Entities contacted include:

- Manufacturers Association of Nigeria (<http://www.manufacturersnigeria.org/>)
- MAN Export Promotion Group (<http://www.nigerianexporter.org/>)
- Manufacturing Today (Nigeria) (<http://www.manufacturingtoday.com.ng/>)
- Corporate Nigeria (www.corporate-nigeria.com/)
- Nigeria Export (<http://nigeriaexport.com/>)
- Nigerian National Bureau of Statistics (www.nigerianstat.gov.ng)

³⁸Available at: <http://www.vconnect.com/>

- Federal Ministry of Trade and Investment (<http://www.fmti.gov.ng>)
- Bank of Industry (www.boinigeria.com)
- Corporate Affairs Commission (<http://new.cac.gov.ng/home/>)
- Nigerian Investment Promotion Commission (<http://www.nipc.gov.ng/>)
- Nigerian Institute of Social and Economic Research (<http://www.nisonline.org/index.php>)
- UNIDO Nigeria (<http://www.unido.org/en/where-we-work/africa/offices/nigeria.html>)

The process used to construct the sampling frame for Nigeria was the following:

1. Given the delay in starting the project as a result of the difficulties with the sampling frame, analysts were given companies for which we were only able to confirm 1 of the eligibility criteria: must be a manufacturing company. The second, must have a minimum of 50 employees, was not confirmed.
2. Eligibility requirements to conduct an interview are as follows:
 - (a) Plant Manager must have been in position for a minimum of 1 year
 - (b) If no Plant Manager at the plant, interviewee must hold a position which requires him/her to have full knowledge of the day-to-day running of the plant

B.6 Tanzania

The Tanzania sampling frame is the largest one for Africa with 772 companies (822 plants). This frame was the easiest one to construct thanks a list of manufacturing establishments published online by the Ministry of Trade, the Tanzania Bureau of Standards directory and the Enterprise Map. Many company names were found in more than one source, so they were included in the count for the first list in which they were found.

- **John Sutton’s Enterprise Map of Tanzania:**³⁹ This is a paper published by the International Growth Centre (ICG) in 2012 which aims to provide a standardised description of Tanzania’s current industrial capabilities. The examples of key companies provided for each industry were included in the sampling frame. Background information on these companies generally did not

³⁹Available at: http://personal.lse.ac.uk/sutton/tanzania_final.pdf

allow us to determine whether they were eligible for the project. 253 companies mentioned in the Enterprise Map were included in the sampling frame.

- **Ministry of Trade List of Establishments:**⁴⁰ This list of establishments in Tanzania was found online. It contains information on 733 companies, 317 of which are in the manufacturing sector and all of which are included in the sampling frame. This list included the following company details: name, address, telephone, mobile and fax number, as well as contact person details (including personal contact). This list is only available as an excel document so the publication year is unknown.
- **Tanzania Bureau of Standards:**⁴¹ This bureau was established under the Ministry of Trade to standardise quality control of products manufactured in Tanzania. This directory is not an exhaustive list of manufacturing companies in Tanzania, but the increasing importance of standardisation and certification in the industry means that a substantial number of the larger companies will be included in the directory. The TBS directory yielded 148 companies.
- **Eastern and Southern Africa Dairy Association: Dairy trade directory:**⁴² This association includes dairy companies from several countries being surveyed in this project: Tanzania, Kenya, Zambia and Ethiopia. For Tanzania, 16 companies which had not previously been found in a different source were added.
- **International Trade Centre for the Tanzania Cotton Board**⁴³ This brochure, published as part of the ACP Agricultural Commodities Programme, contains an overview of the cotton industry in Tanzania. It also includes a list of ginning companies and their contact details. 34 companies were taken from this list and included in the sampling frame.

Several entities were contacted by email and telephone to enquire about existing business directories and lists of manufacturing companies. No responses were received. Entities contacted include:

- Tanzania Chamber of Commerce, Industry and Agriculture
- Confederation of Tanzania Industries

⁴⁰ Available at: http://www.tic.co.tz/media/Guide_book_2014_for_flip.pdf

⁴¹ Available at: <http://www.tbs.go.tz/directory/>

⁴² <http://www.dairyafrika.com/directory.asp>

⁴³ Available at: http://www.coton-acp.org/sites/default/files/documents/downloads/final_tanzania_brochure_october_2011.pdf

- Institute of Management and Entrepreneurship Development- Bharati Vidyapeeth University
- CDC Group (Commonwealth Development Corporation)
- East African Community
- Tanzania Private Sector Foundation
- Arusha Chamber of Commerce
- Zanzibar Chamber of Commerce
- Tanzania Industrial Research and Development Organisation
- Small Industries Development Organisation

The process used to construct the sampling frame for Tanzania was the following:

1. Extracted company names and contact information from all sources above apart from the Enterprise Map, which provided company names but no contact details. All other sources provided company contact details and address. Companies with no contact information were searched in Google, most numbers being available online in directories such as Tanzania YP and 123 Tanzania.
2. The vast majority of companies did not have a website, and many were hard to find online. Information regarding the number of plants, separate plant contact information, the number of employees and the industry category was therefore very difficult to find. Similarly, apart from contact details no other relevant information was provided by the above sources. For this reason analysts were given companies which we were unable to confirm met the eligibility requirements of the project, which include:
 - (a) Must be a manufacturing company
 - (b) Must have a minimum of 50 employees
3. Eligibility requirements to conduct an interview are as follows:
 - (a) Plant Manager must have been in position for a minimum of 1 year
 - (b) If no Plant Manager at the plant, interviewee must hold a position which requires him/her to have full knowledge of the day-to-day running of the plant

At the start of the project 2 Swahili-speaking analysts were given 220 companies each. In week 2 of the project one of the analysts left the project, so for the next 2 weeks the only remaining Swahili speaker was in charge of Tanzania. In the second half of the project when analysts were beginning to saturate their books Tanzanian companies were distributed among all Africa analysts.

Although the majority of managers contacted in Tanzania can communicate in English, there were many cases in which the manager in charge spoke only Swahili. For Swahili interviews, given the absence of a second Swahili speaker to double score after week 2, all scores were reviewed in detail with a manager.

Of the 874 companies initially found, we were unable to find contact details for 52 of them (although a significant number of the numbers we did find were later found to be invalid, outdated or not in use).

B.7 Zambia

Constructing the Zambia sampling frame was more difficult due to an inability to find a directory or list including a substantial number of companies. Apart from the Enterprise Map of Zambia and the COMESA Business Council directory, we were unable to find comprehensive sources of company names and details, and a significant part of the sampling frame was thus built by looking for companies in online directories such as the Yellow Pages. The final sampling frame contained 302 companies and 340 plants, and contact details for 336 of those plants.

- **John Sutton’s Enterprise Map of Zambia:**⁴⁴ This is a paper published by the International Growth Centre (ICG) in 2012 which aims to provide a standardised description of Zambia’s current industrial capabilities. The examples of key companies provided for each industry were included in the sampling frame. Background information on these companies generally did not allow us to determine whether they were eligible for the project. Compared to the other countries surveyed in John Sutton’s Enterprise Maps (Ghana, Tanzania, Ethiopia), the number of Zambian companies mentioned by Sutton and included in the sampling frame is relatively small at only 60 companies.
- **COMESA Business Council:**⁴⁵ The COMESA Business Council is an agency

⁴⁴Available at: http://personal.lse.ac.uk/sutton/sutton_zambia_press.pdf

⁴⁵Available at: http://www.comesabusinesscouncil.org/index.php?option=com_contentview=articleid=54Itemid=51

in charge of fomenting business and supporting the private sector in Eastern and Southern Africa. The Zambian section of COMESA's business linkages page provided us with company names, industry and contact details, including address and relevant contact. This directory yielded 194 companies.

- **Zambia Association of Manufacturers (ZAM):**⁴⁶ The ZAM is an organisation that represents the interests of the manufacturing sector in Zambia. After a Google search we found a 'Mini directory' (in excel form) which was supposed to be followed by a full directory of ZAM members. This 'Mini directory' was dated 2007, and can no longer be found online. No sign of a members directory on the ZAM website or anywhere online. 156 companies found in the mini directory were also found in the COMESA Business Council directory.
- **Zambia Association of Chambers of Commerce and Industry Business Directory:**⁴⁷ ZACCI represents different private sector interests in Zambia's various regions, its main aim being the development of business, commerce and the private sector. 25 of the sampling frame's companies were taken from this directory, which was in itself very limited. The association does not currently have an official website, and the directory is not available online (as of 24 September 2013).

Given the relatively small number of companies found in online lists and directories, we began searching for companies in Zambia's Official Yellow Pages website.⁴⁸ Typing 'manufacturing' in the search box yielded 2 results, so we searched for companies based on specific industry (e.g: plastics or wood). 57 of the sampling frame companies were found in Zambia's online Yellow Pages.

Several entities were contacted by email and telephone to enquire about existing business directories and lists of manufacturing companies. No responses were received. The majority of telephone numbers found online did not work, or did not go through. Entities contacted include:

- Livingstone Chamber of Commerce
- Zambia Association of Chambers of Commerce and Industry
- Lusaka Chamber of Commerce and Industry

⁴⁶ Available at: <http://www.zam.co.zm/>

⁴⁷ Originally available at: <http://www.zambiachambers.org>. Since then, website is unfortunately no longer in use

⁴⁸ Available at <http://www.yellowpages.co.zm/>

- COMESA
- British High Commission Lusaka
- Zambia Embassy London
- Zambia Ministry of Commerce, Trade and Industry
- Zambia Bureau of Standards
- Zambia Association of Manufacturers
- Patents and Companies Registration Agency
- Zambia Business Licensing Portal (e-Registry)
- Zambia Revenue Authority
- Southern African Enterprise Network (SAEN)
- Zambia Development Agency

The process used to construct the sampling frame for Zambia was the following:

1. Extracted company names from the Enterprise Map, and extracted company names and contact details from the COMESA/ZAM (ZAM contained only numbers included in COMESA) and ZACCI directories.
2. Searched for companies in Zambia's Official Yellow Pages website.
3. The vast majority of companies listed in the directories did not have a website and were difficult to find online. Information regarding the number of plants, separate plant contact information, the number of employees and the industry category was not available online. It was also difficult to confirm whether companies were actually in the manufacturing sector. For this reason analysts were given companies which we were unable to confirm met the eligibility requirements of the project, which include:
 - (a) Must be a manufacturing company
 - (b) Must have a minimum of 50 employees
4. Given the limited scope of the directories used, we used Zambia's official yellow pages to find company names and did this by searching for companies within specific industries in the manufacturing sector.
5. Eligibility requirements to conduct an interview are as follows:

- (a) Plant Manager must have been in position for a minimum of 1 year
 - (b) If no Plant Manager at the plant, interviewee must hold a position which requires him/her to have full knowledge of the day-to-day running of the plant
6. At the start of the project 2 analysts were given an equal number of Zambian companies to call (177). After the first week it was found that the Zambian sampling frame contained a high number of companies which were not eligible (not manufacturing, less than 50 employees) or had invalid phone numbers. Throughout the project we have searched the ‘no number’ companies on Google, and although we have been able to find some numbers a lot of the companies cannot be found online.

After the first wave of the Africa project, a second attempt was made at building a sampling frame for Zambia. A former Africa team analyst based in Zambia. Materials provided for this work included lists of 14 relevant entities to be contacted, 78 ‘no numbers’ companies (from the first wave) and an existing sampling frame of 490 companies.

Sources used to search for new numbers and confirm existing numbers include a print copy of the Zambia Yellow Pages and Google.

The process used to strengthen the sampling frame for Zambia was the following:

1. During the first 2 days the analyst focused on obtaining a list of manufacturing firms and their contact details. Signed letters were sent to ZDA (3 February 2014), ZRA (6 February 2014) and PACRA (3 February 2014) following. Contacted organisations include:
 - Zambia Chamber of Commerce and Industry (ZACCI): ZACCI indicated that they do not have a comprehensive list and referred us to ZAM, but added that they would be able to provide a short list.
 - Ministry of Commerce, Trade and Industry
 - Zambia Bureau of Standards
 - Zambia Development Agency (ZDA): ZDA sent a list of 110 manufacturing firms, of which 93 were not on the existing sampling frame, and contact details were searched for the 93 companies on Google and a print copy of the yellow pages. Out of the 93 companies, 69 had no numbers online or

in the yellow pages, 12 were found to not be manufacturing companies, 3 had less than 50 employees, 7 were unreachable and 2 qualified for the project.

- Zambia Association of Manufacturers (ZAM): ZAM informed provided a list at a fee of \$50 but added that this would not include all manufacturing firms in Zambia as membership to the association is voluntary. The representative stated that the list would include over 200 companies with their contact details. 63 new companies were found in this list. Their eligibility has not been confirmed.
 - Patents and Companies Registration Agency (PACRA)
 - Zambia Revenue Authority (ZRA)
2. Numerous follow-ups have been made, including a visit to the companies' regional offices in Kitwe. The visit did not yield positive results as all requests of this nature are handled by head office in Lusaka.
 3. From the 'no numbers list,' new numbers were searched for online and from the yellow pages. New numbers for 29 companies were found and tried, out of which 7 worked and were confirmed to be numbers for the listed companies.
 4. From the yellow pages 449 new manufacturing companies were found, however their eligibility has not been confirmed.

The final sampling frame contains 512 new companies, of which only 63 have been confirmed to be manufacturing (the rest were listed as manufacturing in the Zambia Yellow Pages). None of the companies' eligibility has been confirmed in terms of number of employees until calling for verification.

C Feedback from Managers - African manufacturing

With an eye on policy, one of the advantages of participating in the WMS for the managers who are interviewed is that we offer a summary report of our findings within a few months of the interview. We had an exceedingly positive response from African managers to our report, some which we report below.⁴⁹ We were truly overjoyed with their responses.

Note that these are copied and pasted from their feedback emails, and names omitted for confidentiality.

Managers from Ethiopia:

- *I am thankful too, and pleased to hear that you successfully realized the work.*
- *I have got and read the Amharic version of your letter. I would like to say thank you very much for your considerations of the data and information I gave you on behalf of my company on your research work.*

Managers from Ghana:

- *Thanks for sending me the report. I look forward to working with you again in future. Regards.*
- *Sir, You are always welcomed. I will be glad if you can send me an invitation to come to the LSE to present a work on "meat processing industry in Ghana." We want to create awareness and if possible open ways to foreign investment into that sector. Regards.*

Managers from Kenya:

- *I have happened to read your manufacturing report 2014, I wasn't interviewed by any person from your group. I got this report from my Production Manager Mr. [manager] of [company], Kenya. For the thirst and hunger of knowledge, wisdom and skills I requested him to help me read the content. Wow! It is great report. In future I request you to incorporate me in any research that you would carry on. Regards. (Note: this manager was not interviewed by the WMS!)*

⁴⁹The reports are available on our website in all the languages covered.

- *Hi, I am so excited about this. Thank you so much for rewarding me with all this info.*
- *Thank you for your mail and thanks for sharing the report with us. I have gone through the report and it is very interesting and a lot of things does really make sense. Congratulations and keep up it and in future if you do require any other assistance then do not hesitate to get back to us. Regards.*

Managers from Nigeria:

- *First. I apologise for late reply. This research project explores differences in management practices across organizations of differences nations for economic performance. Is good and will help me critically assessing the management structure in firm. I am happy with your comment on the summary page 16 "competition has long pointed to as an effective driver of productivity because it forces firms with lower levels of structure management to improve or exit the market" hence I will like you to encourage us African countries to increase target/talent rewarding on productivity to enable us drive the economy to a better performance. Thanks.*

Managers from Zambia:

- *Thank you for the Report. I'll take time to go thru' the report and will be happy to post comments to you. Thank you for giving me the opportunity to be part of your research and should you require any information please feel free to contact me. Incidentally, the Lusaka Chamber of Commerce and Industry which had been dormant for some time has been revived and I was elected as a member of the Executive Committee. So now I am in a better position to give you information. Regards.*

D Sampling frame construction: India

D.1 Indian hospitals

The hospital sampling frame was constructed using several online sources (data from these sources were extracted between December 25 2011 and January 20 2012)

- **National Accreditation Board for Hospitals Healthcare Providers (NABH):**⁵⁰ This is a constituent board of Quality Council of India, set up to establish and operate accreditation programme for healthcare organisations. The first list contains the names, accreditation number and validity dates of all 118 accredited hospitals in India (as of March 21 2012, this number has increased to 126). The second list contains the names, date and status of application of 440 accredited hospitals in India (as of March 21 2012, this number has increased to 445).
- **Medicards.in:**⁵¹ An online buyer's guide/directory for the India healthcare industry which collects visiting cards for professionals in the healthcare industry and updates the information online. The website provides information about products/ services, details about companies, dealers, hospitals, colleges, events, trade shows related to Indian healthcare industry. Its hospital directory contains 6,821 entries.
- **Hospital Khoj:**⁵² This is an online search engine for general as well as non-allopathy, women's hospital and specialist hospitals and clinics in India. The website is run by a private company and contains the name and contact info for 4,731 hospitals and clinics in India. Hospital Khoj generously helped us with an Excel version of their list, which greatly facilitated our work and we thank them for that.
- **Cite HR:**⁵³ A community knowledge base for HR professionals. One of the members has published a list of 3,226 hospitals in India on the website.
- **Hospitals in India:**⁵⁴ An online search engine for the best hospitals in India.

⁵⁰ Available at: <http://www.nabh.co/main/hospitals/accredited.asp>;
<http://www.nabh.co/main/hospitals/applicants.asp>

⁵¹ Available at: http://medicards.in/userpage/hospital_list.php?menuId=12

⁵² Available at: <http://www.hospitalkhoj.com/general.htm>

⁵³ Available at: <http://www.citehr.com/110771-all-india-hospitals-adresses-contact-nos.html>

⁵⁴ Available at: <http://www.hospitalsinindia.org/>

It contains the name and contact info of 95 hospitals.

The process used to construct the sampling frame and contact hospitals was the following:

1. Extract hospital names, contact info and all other info available from these five sources. This yielded a total of 15,431 entries.
2. Append all lists and remove duplicate entries and ineligible hospitals using:
 - (a) Exact match with hospital name;
 - (b) Exact match with state and city;
 - (c) Dropping hospitals containing the following words in the name (acupuncture, advanced glaucoma, plastic, ENT research foundation, neuro, mental, maternity, maternity, cosmetic, child care, ENT, communicable diseases, bone joint, day care, clinic of integrated medicine, diabetes, integrated organ transplant, reproductive, poly clinic, polyclinic, community hospital, surgical clinic, physiotherapy, nursing, digestive, diabetic, leprosy, scanning, laproscopic, micro surgery). This yielded a total of 7,191 entries. This number is in agreement with statistics from the Ministry of Health reporting that 7,008 rural and urban hospitals exist in India⁵⁵
3. Extracted a random sample of 4,200 hospitals from this list.
4. Call hospitals in the random sample (distributed approximately 250 to all analysts randomly), verify eligibility to participate in the survey, and schedule interview. The eligibility criteria are the following:
 - Must have a Ortho/Cardio Department
 - Must provide Acute Care (not just critical care)
 - Must have overnight beds
 - Must speak to medical superintendent/nurse manager/administrator of specialty
 - Tenure of manager in the post must be equal to or over 1 year.

⁵⁵Available at: <http://cbhidghs.nic.in/hia2005/8.01.htm>

D.2 Indian schools

The school sampling frame was primarily constructed using three online sources.

- **District Information System for Education (DISE):**⁵⁶ The District Information System for Education provides detailed information on school name, location, category, management type, enrolment, numbers of classrooms and teachers for over 1.3 million recognised schools imparting elementary education across 635 districts spread over 35 States and Union Territories in India. Despite DISE's focus on primary and upper primary education, they also provide information for 94,501 schools offering secondary/higher secondary education as well as primary education. This database includes schools affiliated with State Boards as well as pan-India Boards (such as CBSE and ICSE, see below). This database, however, contains neither phone numbers nor any other contact information.
- **Central Board for Secondary Education (CBSE):**⁵⁷ This directory provides detailed information for 12,367 schools (elementary, secondary, and higher secondary) affiliated with CBSE.
- **Indian Council of Secondary Education (ICSE):**⁵⁸ This directory provides detailed school name and contact information for 1,869 schools (elementary, secondary, and higher secondary) affiliated with the (ICSE)

The process used to construct the sampling frame and contact schools was the following:

1. Extract school names, contact info and all other info available from these three sources. This yielded a total of 12,089 entries for CBSE affiliated schools, 1,869 entries for ICSE affiliated schools, 94,501 entries for schools in the DISE database.
2. Append all lists and match by name and postcode any CBSE or ICSE affiliated schools with schools in the DISE database. This yielded a total of 108,688 entries.
3. Drop schools with less than 75 students (or number of students missing). This yielded a total of 55,492 entries.

⁵⁶ Available at: <http://www.dise.in/>

⁵⁷ Available at: <http://164.100.50.30/SchoolDir/userview.aspx>

⁵⁸ Available at: <http://www.cisce.org/>

4. Extract a random sample of 2,900 schools and search for phone numbers. This yielded a total of 1,142 entries with phone numbers. To find the phone numbers, we searched on Google (maps, schools/boards websites), called JustDial (the Indian version of yellowpages), searched through the Economic Census directories from MOSPI (India's Ministry of Statistics and Programme Implementation) and called/visited School Boards of all states. After exhausting the direct ways of finding phone numbers, we are now calling other schools and businesses in the surrounding areas of the schools in our random sample and asking them to find out the phone numbers for us. This last strategy worked surprisingly well!
5. Call schools with phone numbers in the random sample (distributed 100 ? 130 to the analysts randomly), verify eligibility to participate in the survey, and schedule interview. The eligibility criteria are the following:
 - Must offer general education (no special needs or vocational schools)
 - Must offer education to 15 year olds (Standards, or grade, X in India)
 - Must have 75 or more students in the school
 - Must speak to principal or headmaster
 - Tenure of principal/headmaster in the post must be equal to or over 1 year.

D.3 Indian retail

The retail sampling frame was primarily constructed using three sources.

- **Retailers Association of India (RAI):**⁵⁹ This association provides a directory of all its 249 core members (with website, email and contact information for the headquarters) which comprise of approximately 95% of all formal retailers incorporated and/or registered in India (this list does not contain real estate companies which are classified by RAI as retailers).
- **FundoData:**⁶⁰ This business directory provides contact information for 405 top retailers in India.

⁵⁹ Available at: <http://www.rai.net.in/>

⁶⁰ Available at: <http://www.fundodata.com>

- **Bureau van Dijk - Orbis:** This company directory provides information on 359 retail companies operating in India.

The process used to construct the sampling frame and contact retail outlets was the following:

1. Extract retail company names, contact info (including phone numbers and websites) from these three sources. This yielded a total of 1,237 entries.
2. Append all lists and remove duplicates (exact match with company name). This yielded a total of 1,013 entries.
3. Search for websites for all companies in the list. This yielded a total of 743 companies with websites.
4. List all retail outlets listed on the websites for companies with more than one outlet (through the store locator or contact information links, if available) and append this list to a list of companies with no website/contact information and companies with only one outlet. This yielded a total of 28,344 retail outlets.
5. Extract a random sample of 3,400 retail stores.
6. Call retail stores in the random sample (distributed 200 ? 250 to the analysts randomly), verify eligibility to participate in the survey, and schedule interview. The eligibility criteria are the following:
 - Must be a retail store (not a distributor or a restaurant)
 - Must have 10 or more employees in the store
 - Must have 100 or more employees in the company
 - Must speak to store manager
 - Tenure of manager in the post must be equal to or over 1 year (unless previously held assistant manager position for a year and was in charge of goal-setting/HR along with the manager)

References

- Bertrand, M. & Schoar, A. (2003), ‘Managing with style: the effect of managers on firm policies’, *The Quarterly Journal of Economics* **118**, 1169–1208.
- Black, S. E. & Lynch, L. M. (2001), ‘How to compete: the impact of workplace practices and information technology on productivity’, *The Review of Economics and Statistics* **83**, 434–445.
- Bloom, N., Eifert, B., Mahajan, A., McKenzie, D. & Roberts, J. (2013), ‘Does management matter? evidence from india’, *The Quarterly Journal of Economics* **128**, 1–51.
- Bloom, N., Kretschmer, T. & Van Reenen, J. (2010), ‘Are family-friendly workplace practices a valuable firm resource?’, *Strategic Management Journal* .
- Bloom, N., Lemos, R., Sadun, R., Scur, D. & Van Reenen, J. (2014), ‘The new empirical economics of management’, *Journal of the European Economic Association* **12**(4).
- Bloom, N., Lemos, R. & Tanaka, M. (2015), Enterprise map of myanmar. LSE project.
- Bloom, N., Sadun, R. & Van Reenen, J. (2012), ‘The organization of firms across countries’, *The Quarterly Journal of Economics* **127**(4), 1663–1705.
- Bloom, N. & Van Reenen, J. (2007), ‘Measuring and explaining management practices across firms and countries’, *The Quarterly Journal of Economics* **122**, 1351–1408.
- Bloom, N., Van Reenen, J. & Sadun, R. (2012), Management as a technology?, Technical report, London School of Economics.
- Ichniowski, C., Shaw, K. & Prennushi, G. (1997), ‘The effects of human resource management practices on productivity: A study of steel finishing lines’, *The American Economic Review* **87**, 291–313.
- Lemos, R. (2015), The returns to employees’ higher education quality for the firm. Unpublished manuscript.
- Lemos, R. & Scur, D. (2015), All in the family? ceo choice and firm organization.
- Lemos, R. & Scur, D. (n.d.), Developing management: an expanded evaluation tool for developing countries.

Manski, C. (2004), 'Measuring expectations', *Econometrica* **72**(5), 1329–1376.

McKenzie, D. & Woodruff, C. (2015), Business practices in small firms in developing countries, NBER Working Papers 21505, National Bureau of Economic Research.