

Working paper



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Management
Practices in
Manufacturing
in Mozambique



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Management Practices in Manufacturing in Mozambique

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Report for the International Growth Centre (IGC)¹

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Executive Summary

Introduction: This report explores differences in management practices in the manufacturing sector in Mozambique. In early 2014, the research team of the World Management Survey (WMS) implemented a methodology that systematically measures the quality of management practices at the establishment level. We used an interview-based evaluation tool that defines and scores a set of 18 basic management practices from one (“worst practice”) to five (“best practice”) to assess management quality of 108 Mozambican manufacturing firms.

The 18 practices fall into four broad areas:

1. Operations Management: have companies adopted both the letter and the spirit of modern manufacturing techniques?
2. Performance Monitoring: how well do companies track what goes on inside their firms?
3. Target Setting: do companies set the right targets, track the right outcomes and take appropriate action if the two dont tally?
4. Talent Management: are companies hiring, developing and keeping the right people (rather than people they could do without) and providing them with incentives to succeed?

Findings: We use management practices data from Mozambique as well as other 32 developed and developing countries and focus on a comparative analysis of firms within and across countries. We find four sets of results:

- First, African countries are towards the bottom of the international rank of management practices, and Mozambique in particular is ranked at the bottom of our management index. Mozambican firms have only limited monitoring of production processes, infrequent, short-term and narrow targets, and relatively ineffective human-resource management.
- Second, although some firms in Mozambique have high quality management practices, there is a substantial number of badly-managed firms co-existing with these

well managed firms, dragging down the country’s average management scores. In fact, we show that 89% of Mozambican firms score within the range of the bottom quartile of US firms. However, the spread of management practices within Mozambique is quite wide, suggesting that while it is possible to implement management best practices more widely across firms.

- Third, when considering the four areas of management practices separately, we see that operations management seem to show the largest gap followed by performance monitoring and target setting between Mozambique and other African countries. When comparing Mozambique with India and China, we observe that, again, operations, monitoring and targets seem to be significant areas of improvement opportunity. That is, Mozambican firms are lagging behind their peers within their region and within other emerging economies.
- Fourth, drawing from the previous three results, we observe two factors that can potentially be determining the low management quality implemented in Mozambican firms: informational barriers and workforce skills.

Recommendations: There remain large gaps between the best and the worst managed firms in Mozambique. As Mozambique is at the bottom of our management index, its position and overall productivity could be significantly increased by raising the management quality of Mozambican firms especially in the lower tail of the management distribution.

Ways to improve management quality include,

- *Improving Workforce Education and Skills:* Adapting existing successful initiatives within the Technical and Vocational Education and Training (TVET) reform framework to add a management practices training component such as:
 - Offering technical training and workshops to current managers and employees taking into account and incorporating the types of managerial skills needed and previously identified in each sector.

- Offering government-supported apprenticeships programs in partnership with private organizations and industry in order to train and develop the youth workforce and to provide an avenue for matching workforce skills and firm-specific management practices.
- *Closing the Information Gap:*
 - Creating management demonstration projects, showcasing modern management techniques with the aim of enabling managers to envision ways to incorporate best practices in their own firms.
 - Helping managers critically evaluate their own management practices by using a diagnostic measurement tool which would allow managers to identify management performance strengths and areas for improvement.
 - Holding workshops about best practices, create easy-to-read publications to disseminate latest best practices developments.

1 Introduction

The causes and consequences of the vast inequality of GDP across countries has been the subject of research projects for decades and will continue to be so as we dig into the black box of economic development. One factor long thought to be linked to these differences is the quality of management practices implemented at the establishment level across industries and sectors (Bloom et al., 2014). Naturally, the management of an establishment can have a number of distinctive features. Understanding the diversity in management quality as well as its relationship with economic performance is a crucial step towards understanding the emergence and expansion of a sector, as well as its contribution to economic development as whole.

This report explores differences in management practices in Mozambique. The Instituto Nacional de Estatística (INE) reports that the principal sector in the Mozambican economy continues to be agriculture, representing between 27-29 percent of the GDP in the last 5 years and making a vital contribution to the country’s economy. However, its relative importance is declining in the face of rapid industrialization in other sectors. In the same period, INE reports that the manufacturing sector contributes between 10-12 percent of the GDP (also followed by the transportation industry representing another 10-12 percent of the GDP). Given the manufacturing sector’s increasing importance in the economy, it becomes paramount to understand how establishments in this sector are managed across the country.

In early 2014, the research team of the World Management Survey (WMS) implemented a methodology that systematically measures the quality of management practices at the establishment level. We used an interview-based evaluation tool that defines and scores a set of 18 basic management practices from one (“worst practice”) to five (“best practice”) to assess management quality of 108 Mozambican manufacturing firms.²

The World Management Survey is a decade long initiative aiming to systematically mea-

²For more information and for the full survey grid for manufacturing, see www.worldmanagementsurvey.org.

sure the quality of management practices across countries and industries. After collecting management data for over 13,000 manufacturing firms around the world,³ we have seen interesting patterns emerge that start to shed some light on this topic.

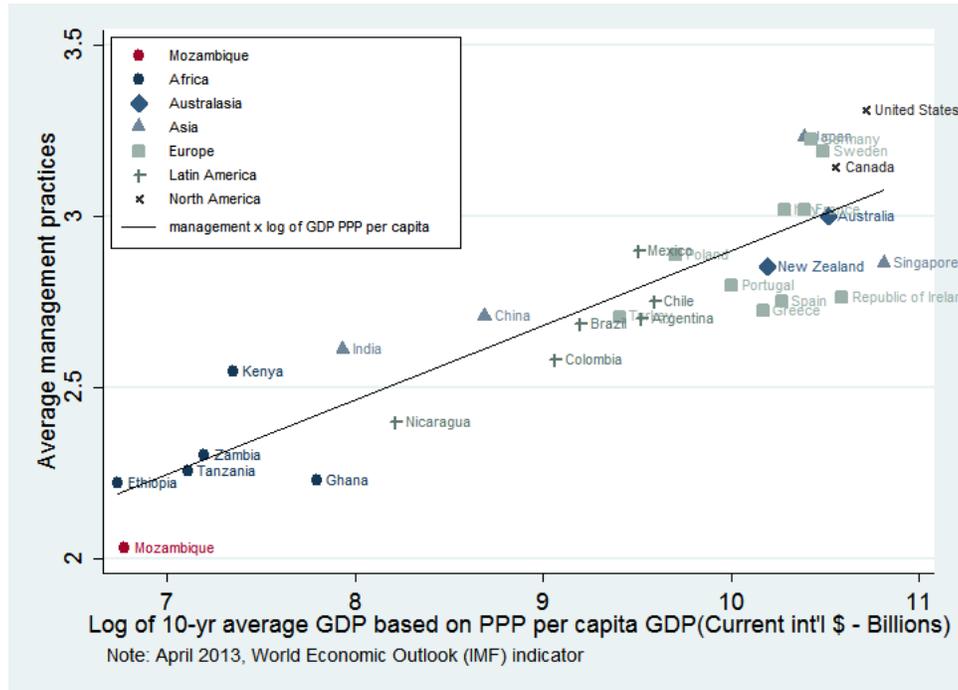
Previous studies have found that management practices - defined in terms of monitoring, targets and incentives - are robustly linked to firm and national performance. In short, these studies find that, on average, better managed manufacturing firms have higher productivity (as measured by sales per employee, 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 (Bloom and Van Reenen, 2007; Bloom et al., 2012). Our past research shows that improving management practices is a highly leveraged means of getting more output from firms existing labour and capital. Increasing the quality of management, as we measure it, by one point is the equivalent of a 65% increase in capital, or a 25% increase in labour, and is true for all companies independent of sector, profitability, past productivity growth and size. A simple correlation between our country-level aggregated management measure and the log of GDP (in PPP per capita) shows that our measure does indeed hold some information about country productivity (Figure 1).

Of course, we do not claim any causal relationship in this report, but the results are indicative that this is an interesting area to study. The one claim of causality that this body of research can make comes from a recent field experiment on 28 large Indian textile factories (Bloom et al., 2013). 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%.⁴

³The WMS team has also collected management data from nearly 1,100 retail firms, 1,700 hospitals and 1,800 schools across countries

⁴Considering 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

Figure 1: Average management scores and GDP per capita



In this report, we will provide the first set of results for the Mozambican manufacturing sector using our current dataset as a comparison group. The structure of this report is as follows: Section 2 describes the methodology of the survey and the data used in this paper. Section 3 describes the data we collected and the patterns that emerged. Section 4 discusses two important drivers of management quality: informational barriers and workforce skills. Section 5 outlines some policy implications of this research and concludes.

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 and 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 and 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.

2 Data and Methodology

2.1 Defining and scoring management practices

To measure management practices, the WMS team has developed a new survey methodology described in Bloom and Van Reenen (2007). We use an interview-based evaluation tool, initially developed by an international consulting firm, that defines and scores from one (worst practice) to five (best practice) a set of 18 basic management practices on a scoring grid. A high score 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 our main measure of management practices represents the average of these 18 scores.

This evaluation tool can be interpreted as attempting to measure management practices in four broad areas:⁵

Operations Management

Introducing Lean (Modern) Techniques: Measures how well lean (modern) manufacturing management techniques have been introduced

Rationale for Introducing Lean (modern) Techniques: Measures the motivation/impetus behind changes to the operational processes, and whether a change story was well communicated turning into company culture

Performance Monitoring

Continuous Improvement: Measures attitudes towards process documentation and continuous improvement

Performance Tracking: Measures whether firm performance is measured with the right methods and frequency

Performance Review: Measures whether performance is reviewed with appropriate frequency and follow-up

⁵Note: Survey instruments with full set of questions asked available at www.worldmanagementsurvey.org

Performance Dialogue: Measures the quality of review conversations

Consequence Management: Measures whether differing levels of firm performance (not personal but plan/process based) lead to different consequences

Target Setting

Target Balance: Measures whether targets cover a sufficiently broad set of metrics and whether financial and non-financial targets are balanced

Target Interconnection: Measures whether targets cover a sufficiently broad set of metrics and whether financial and non-financial targets are balanced

Time Horizon of Targets: Measures whether targets are tied to the organization's objectives and how well they cascade down the organization

Target Stretch: Measures whether targets based on a solid rationale and are appropriately difficult to achieve

Clarity and Comparability of Targets: Measures how easily understandable performance measures are and whether performance is openly communicated to staff

Talent Management⁶

Managing Talent: Measures what emphasis is put on overall talent management within the organization

Rewarding High Performers: Measures whether there is a systematic approach to identifying good and bad performers and rewarding them proportionately

Removing Poor Performers: Measures how well the organization is able to deal with underperformers

Promoting High Performers: Measures whether promotion is performance-based and whether talent is developed within the organization

Retaining Talent: Measures whether the organization will go out of its way to keep its top talent

Creating a Distinctive Employee Value Proposition: Measures the strength of the em-

⁶These practices are similar to those emphasized in earlier work on management practices, by for example Ichniowski et al. (1997) and Black and Lynch (2001).

ployee value proposition

2.2 Collecting management practices data

Our research design consisted of a two-step approach. First, we constructed a database of medium and large-sized firms (employing between 50 and 5000 employees) throughout the country using online and offline resources. We focus on this size band because these firms are large enough to benefit from structured management practices as we measure them, but not too large that they would not rely primarily on local management.

Second, to ensure the collection of accurate responses, we hired students and young professionals from top universities in the UK who had some business experience and whose native language was Portuguese. We trained them to conduct the interviews using the same methodology we have used for the past decade in the WMS. We focused on interviewing plant managers who were involved in and had full knowledge of the day-to-day running of the plant⁷ and had been in their positions with the company for a minimum of one year. Due to being part of the middle management team, these managers have an overview of their firm's overall management practices without being detached from its day-to-day operations. In Mozambique, interviews lasted for an average of 58 minutes.

In Appendix A, we provide additional information on how we built a sampling frame, maximized response rates, obtained interviews with managers and collected accurate responses.

⁷Enumerators identified plant managers by calling the firm and asking for the person responsible for the day-to-day operations of the plant, and, thus, we focused on the role and job performed by a plant manager instead of focusing on the title per se.

3 Describing Management Practices

3.1 Firm characteristics across countries

Our survey results indicate that the median firm establishment in Mozambique is 18 years old, employs 109 plant employees, operates in only one site and does not export. Overall, the median firm in other African countries, Mozambique's regional competitors, has similar characteristics to median firm in Mozambique, that is, it is 19 years old, employs 106 plant employees, operates in only one site and export a very small portion of its production (3%).

For comparison purposes, we also look at the median firm establishment in India and in China, Mozambique's international competitors. In India, the median firm is 24 years old, employs 170 plant workers, operates across 2 plants and exports 15% of its production. In China, the median firm is 16 years old, employs 500 plant workers, operates in only one site and exports 30% of its production.

The median firm in the US, used in this report as a benchmark, employs a higher number of plant workers (145) than the overall Mozambican median firm, is 42 years old, operates across 4 production plants and exports 10% of its production (Figures 2 and 3).

3.2 Overall management practices

The cross-country ranking for manufacturing management is in Figure 4. The US, Germany, Japan, Sweden have the best management, while southern European countries such as Portugal, Spain, and Greece, and emerging economies such as Brazil, China and India have mid to low management practices, on average. While Kenya and Nigeria outperform the other African countries surveyed, African economies are at the bottom of the ranking, presenting poor management practices, and Mozambique in particular is ranked at the bottom of our management index. From previous work, we find a strong correlation between firm size and quality of management, and thus we also control for firm size when presenting results on the average management scores across countries in Figure 4b. It is evident

Figure 2: Plant age, by country

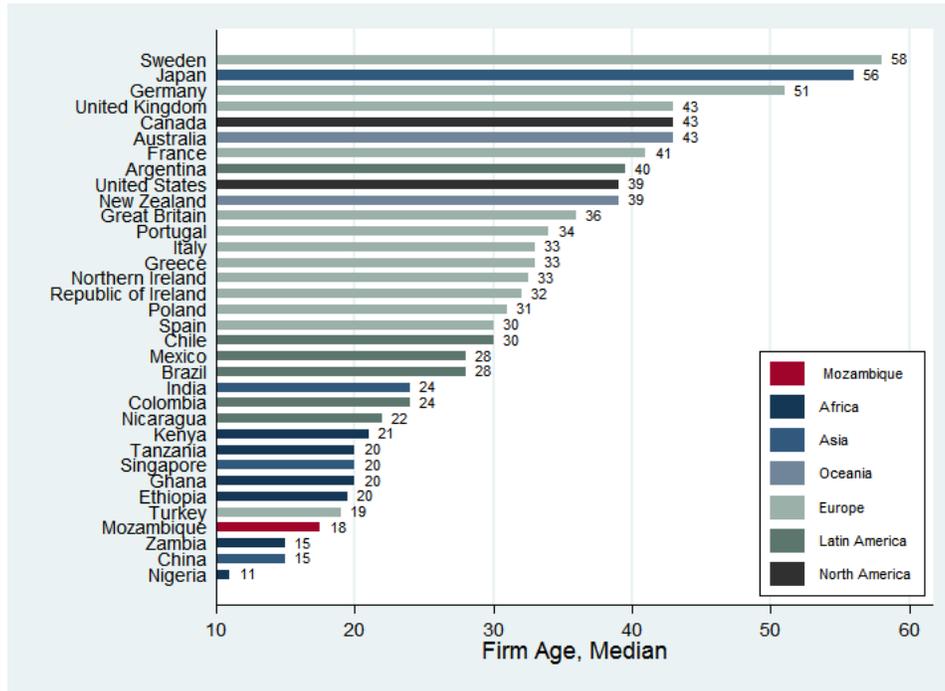
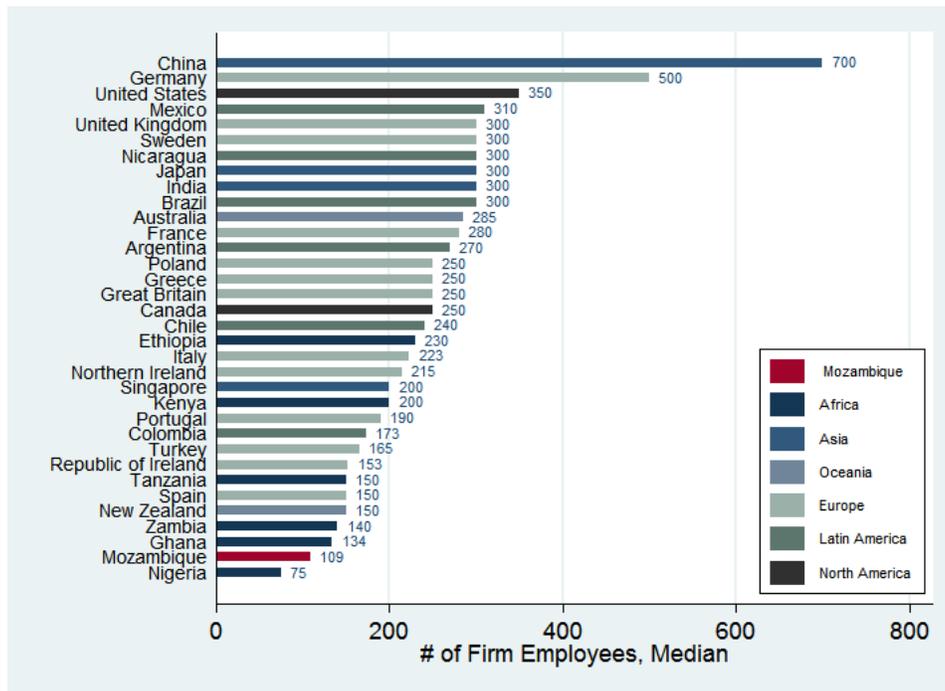


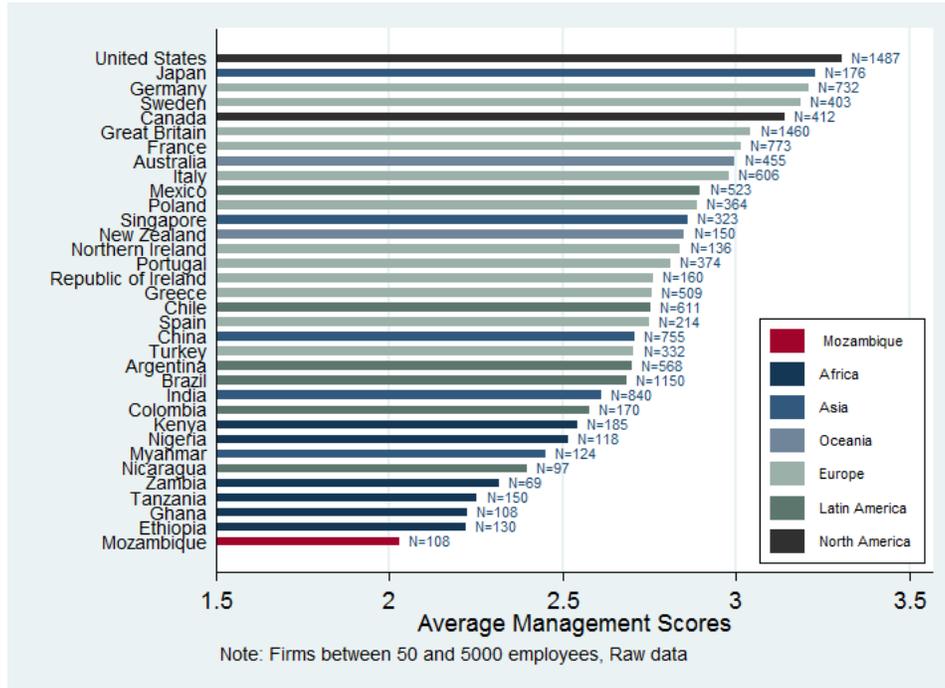
Figure 3: Plant size, by country



that the score changes slightly, but not quite substantially enough to have any effect on its overall ranking.

Figure 4: Management scores across countries

(a) Average Scores, raw



(b) Average Scores, controlling for size

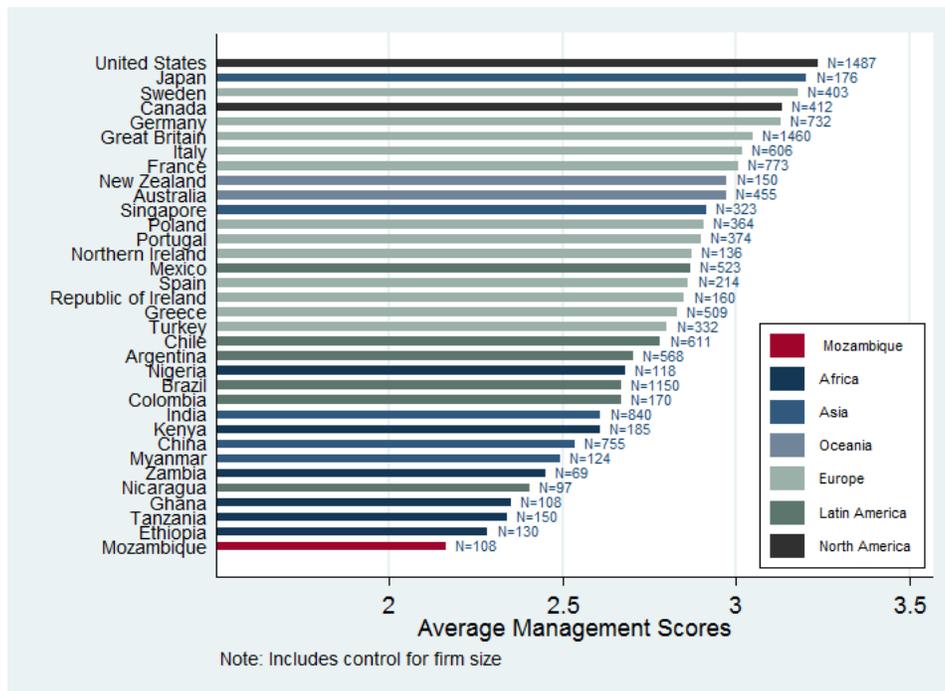
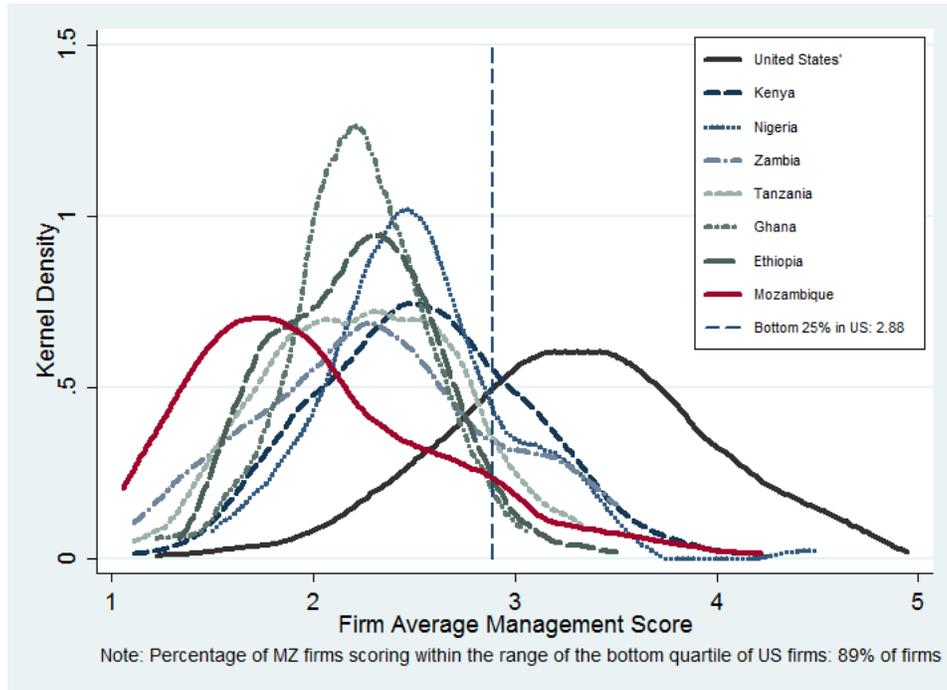


Figure 5 shows a firm-level distribution of management practices by plotting smoothed (kernel) fits of the data for Mozambique (dark red line), other African countries (range of blue toned lines) and the United States (black line). The black line indicates that there are very few badly-managed firms in the US while for all lines representing African countries, we observe a much thicker left tail. As the graph shows, 89% of Mozambican firms score within the range of the bottom quartile of US firms. Notably, however, Mozambique (as well as Kenya) has a slightly more dispersed distribution with some (albeit very few) firms reaching upper 3s-low 4s average scores while Ghana and Ethiopia have quite narrow distributions.

This simple analysis shows that, although some firms in Mozambique have high quality management practices, there is a substantial number of badly-managed firms co-existing with these well managed firms, dragging down the country's average management scores. In fact, our cross-country dataset indicates that 61% of the differences in management practices is attributed to the variation across firms within the same country while only 20% is attributed to the variation between countries. That is, both the overall poor management practices and, particularly, the large differences in management practices within countries could be an important factor behind the lower levels of development in middle- and low-income countries.

As evident from Figures 4 and 5, we find management practices in Mozambique to be, on average, poorer than all other countries surveyed. However, the spread of management practices within Mozambique is quite wide, suggesting that while it is possible to implement management best practices across firms, for some reason they are not being implemented more widely. The distribution of firm management practices in Mozambique is distinctive from that of other African countries whose share of firms scoring above a 3 in our management index (the right-tail of well-managed firms) seems larger than in Mozambique. Also, the average management score at the left tail of badly-managed firms in Mozambique seems to be truncated at 1, that is, a portion of firms present unstructured or poor management practices across all or most of the 18 management topics measured in our survey.

Figure 5: Distribution of management scores



3.3 Management decompositions

As a useful exercise, we decompose our main management quality score into four scores measuring (i) operations management, (ii) performance monitoring, (iii) target setting, and (iv) people management - as described in the Data section - to investigate which particular areas of management are driving low management quality in Mozambique.

Operations measures the degree to which modern manufacturing processes have been implemented, and the rationale behind implementing these changes. An average score of 1.55 implies that very few, if any, modern processes have been implemented, and if they have been, they were generally implemented to catch up with competitors rather than to reach forward-looking business objectives or stay ahead of the curve.

An average score of 2.01 in performance monitoring implies that the average firm lack measures to track and review their performance in a meaningful way. Instead these firms might only have some measures in place to roughly inform plant operations and performance. Discussions about performance often lack enough information and are conducted

infrequently. These firms lack a system to document processes and rarely encourage workers suggestion and participation in decision making in the day to day running of the business.

In terms of targets, an average score of 2.02 implies that the firms have at least an informal set of targets, but that these targets that are perhaps ‘broad objectives’ rather than actionable and measurable targets with clear time frames. For a score above a 3 in target-setting, firms also need to have a good rationale for benchmarking their targets such that these targets are challenging yet achievable. However, this is naturally harder to achieve if the targets are not measurable and actionable in first place.

For higher scores on the targets area of management, firms need to also have a system where all employees not only understand the targets, but also understand their role in achieving these targets. For example, having a target that is clear and actionable such as “Increase ROCE by 1% in the next fiscal year” is very good in terms of being measurable, concrete and with a timeline attached, but it might only be clear if the employee understands the concept of ROCE. For a better score here there should be a link created between this target and individual employees’ day-to-day responsibilities.

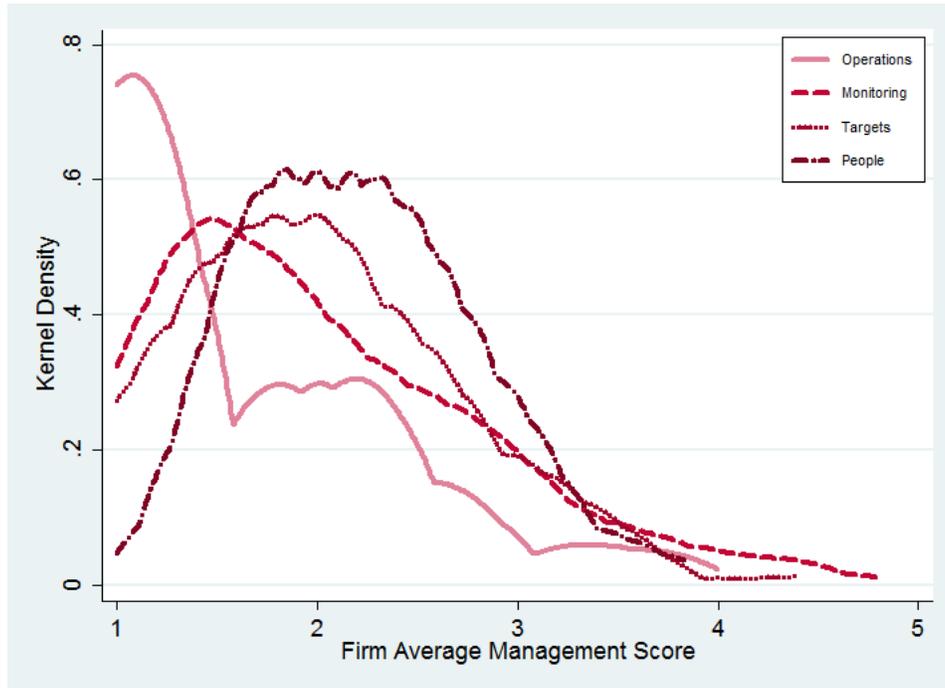
Relative to other areas of management, Mozambican firms present a better people management score on average: 2.21. This score implies that some mechanisms are in place to identify and reward good and bad performers, albeit it is still a reactive management process.

Figure 6 shows the distribution of each management practice area within firms in Mozambique, indicating that there is a wide dispersion in management quality across all 4 areas of management across Mozambican firms.

We also compare the four areas of management across the other six African countries in our dataset – Ethiopia, Ghana, Kenya, Nigeria, Tanzania, and Zambia – in order to understand Mozambique’s regional context.

When considering the four areas of management practices, we see that the gap between Mozambique and other African countries is somewhat consistent throughout all four areas, though operations seem to show the largest gap (Figure 7a) followed by performance moni-

Figure 6: Distribution of management scores



toring and target setting. Interestingly, across most countries, people management has the highest management score (with the exception of Kenya where people management has the second highest average score and Ethiopia where it has the lowest average score).

When comparing Mozambique with India, China, and the US, two emerging economies in our dataset and potential international competitors and our benchmark country, we see that, again, operations, monitoring and targets seems to be significant areas of improvement opportunity (Figure 7b). Examples of a range of practices across all four areas of management are described in Appendix B.

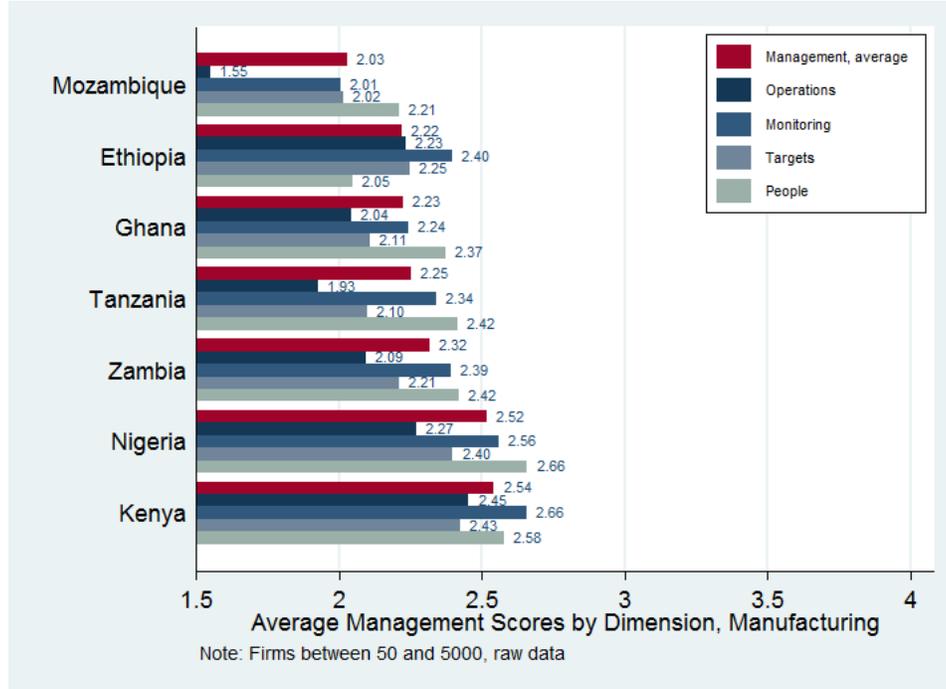
4 Drivers of Management Practices

4.1 Informational barriers

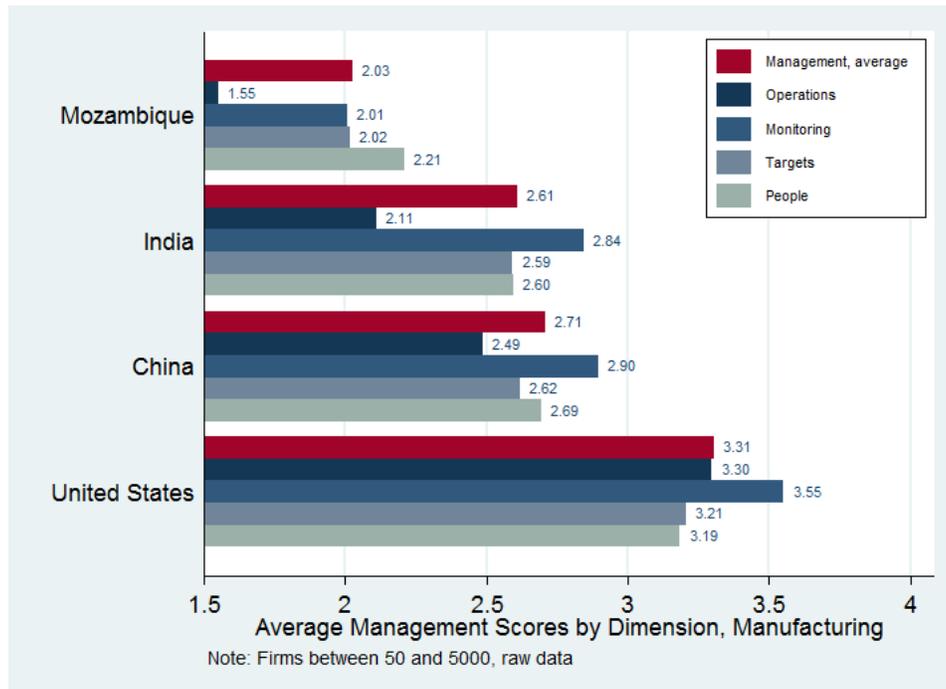
An important driver of management quality stems from the manager's perception of the quality of management of their establishment. The last question in our survey asks managers

Figure 7: Management scores across countries, by area

(a) Mozambique vs other African countries

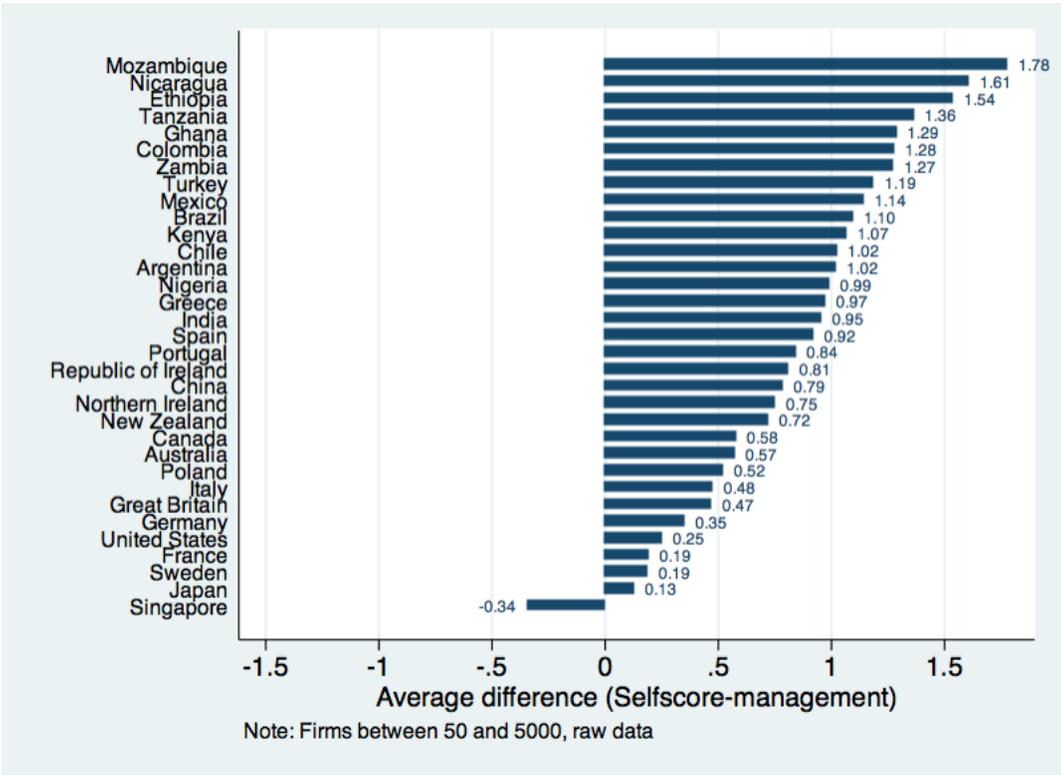


(b) Mozambique vs India, China and US



to score the quality of the management practices in their firm on a scale of 1 to 10⁸, and the average results are quite telling. Dividing their “own score” in half to match our management score scale and taking the difference, it is obvious that Mozambican managers believe the management practices followed by their establishments are substantially better than our measures would indicate. The main issue this raises is that, if managers are not aware of the opportunities for improvement, they are not likely to pursue any initiatives to do so. The gap across countries is shown in Figure 8.

Figure 8: Information gap across countries



4.2 Workforce skills

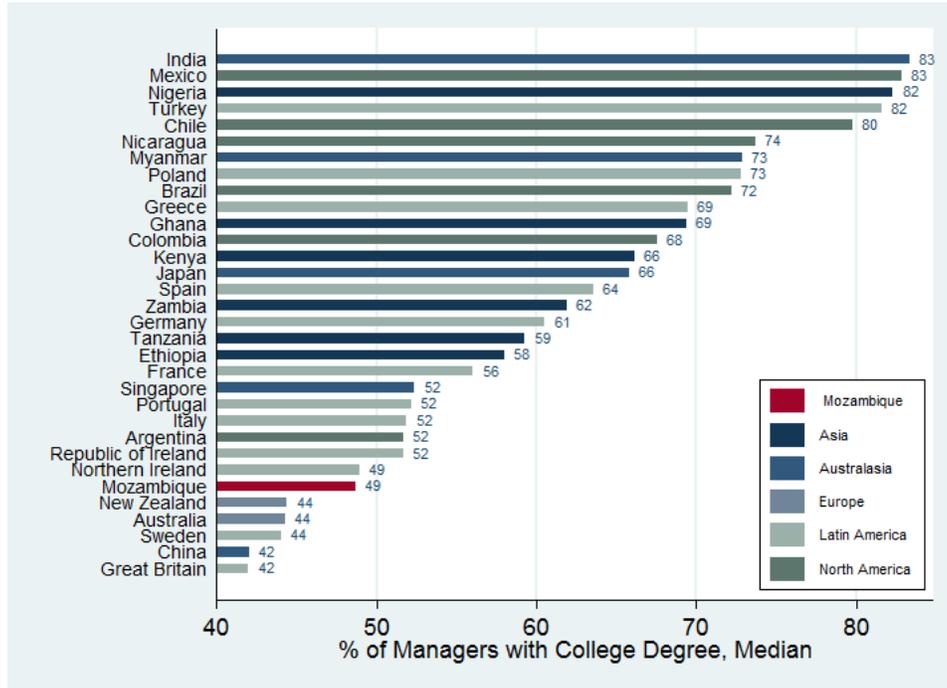
The level of skills of the workforce may be a potential factor linked to the informational gap observed in Mozambican firms. Figure 9 shows the percentage of the workforce with a college degree as reported by the plant manager and indicates very low levels of skilled

⁸Excluding themselves, of course.

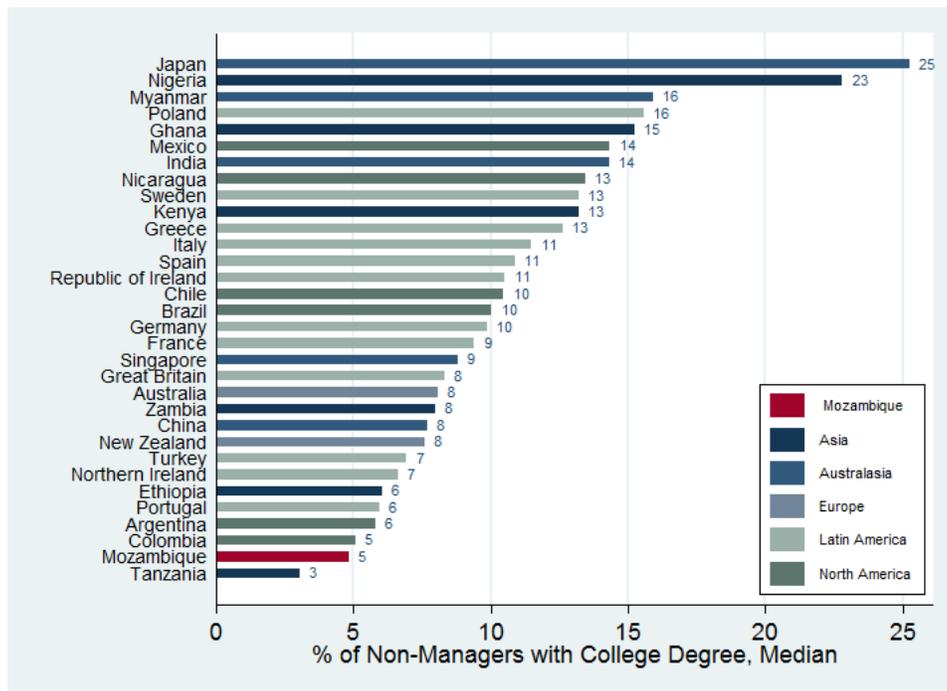
workers in both managerial and non-managerial positions in Mozambican firms: 49% of managers hold a college degree while 5% of non-managers have a college degree.

Figure 9: Workforce education across countries

(a) Share of managers with a university degree

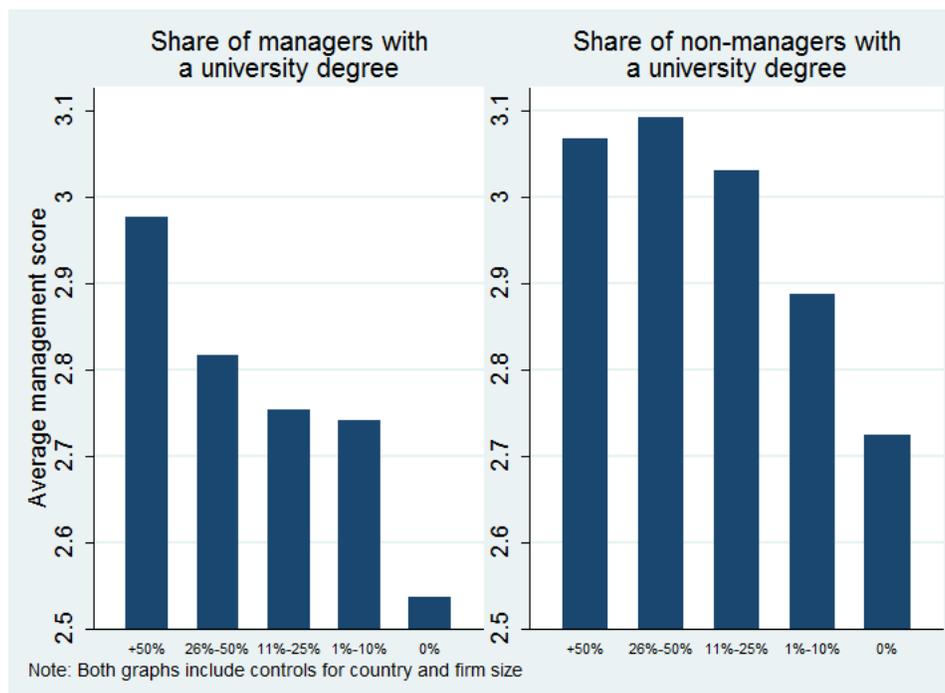


(b) Share of non-managers with a university degree



Given such low numbers, we investigate whether skill set of the workforce is linked to management quality. Figure 10 shows that a qualified and educated workforce is linked to better management practices across countries.

Figure 10: Workforce education and management practices



5 Conclusion and Policy Implications

5.1 Policy points

In this report we have taken the first look at the quality of management practices in Mozambican manufacturing firms. A key question that arises is: why are there so many badly managed firms? Over years of our research we see a set of 2 related drivers of management which have direct policy implications in this context.⁹

⁹**Competition** and **Ownership** are two other main drivers of management. **Competition:** One of the reasons that the United States has practically no left tail (when compared to Latin American countries) is that the level of competition in the US is substantially higher than elsewhere. Competition drives badly run firms out of the market as the better firms tend to win larger shares of the market and effectively “compete out” the badly run firms. Policy aimed at fostering competition should thus be given more attention. **Ownership:**

- **Skills/education:** We find a strong relationship between the share of managers and workers with college degrees and quality of management. This makes sense when considering the importance of not just *knowledge* of best practices, but also of *implementation* of these best practices. Cultural changes within companies are only successful when there is significant buy-in from the employees themselves, and this is often easier to achieve when workers have higher education levels and can be included in discussions about these changes.

Thus, creating incentives for continuing education of managers as well as employees aimed at improving workforce skills and closing the skills gap is an important policy action point. We can see human capital formation as a longer-term policy strategy in the general sense of the clear benefits accrued from a more educated populace. However, there are a few short-term action points as well:

1. Offering technical training and workshops to current managers and employees taking into account and incorporating the types of managerial skills needed and previously identified in each sector. For example, a useful management training program which can be tapped on is the ILO SCORE Training which follows a methodology that combines classroom training with on-site consultations to fully address each firms needs. Among other aspects, the ILO SCORE Training program focuses on basic firm operations management such as encouraging workplace cooperation, continuous improvement and quality assurance culture, improved recruitment, identification and development of skills.
2. Offering government-supported apprenticeships programs in partnership with private organizations and industry in order to train and develop the youth workforce

We find that founder/family owned--*and-managed* firms tend to be significantly worse managed than other firms. This could be an information story - which we will expand on below - but the key point here is that founder/family *ownership* is not the main issue, but rather *control*. Founder/family firms that have a founder/family member as CEO are at the bottom of the ranking in terms of average quality of management practices, but founder/family firms with an external (non-family) CEO are just as good as other privately owned firms. We see room for policy development in terms of minority shareholder protection to allow peace of mind for firm owners to hire professional managers without fear of expropriation.

and to provide an avenue for matching workforce skills and firm-specific management practices. Competence of apprentices can be assessed through a rigorous independent body as well as through employer-led standards to ensure that the specific needs of their industry are being met. For instance, the UK has embarked on such a strategy, partnering with UKs leading businesses to deliver apprenticeships and youth vocational training schemes.

In the context of Mozambique, it is important to emphasize that initiatives to improve management practices can be based on and added as a component to existing successful programmes run by the National Institute of Employment and Vocational Training (INEFP) and the Ministry of Education and Culture as well as other institutions and complement existing government initiatives to tackle labour market needs within the Technical and Vocational Education and Training (TVET) reform framework. Furthermore, a possible interpretation of our results (despite being unable to infer causality) suggest that more educated managers are more likely to be aware of the benefits of introducing or complying with modern management practices and that more educated non-managers might be more receptive towards the introduction and more knowledgeable during the implementation of these practices.

- **Information:** Our research indicates that managers are often unaware they are not following best practices, as mentioned above. We find that a firm's human capital, that is, the stock of competencies and knowledge constituting the skill set of the workforce, is linked to management quality. This suggests that the unawareness of new management techniques and the skills gap may be important factors hampering the absorption of modern management practices in Mozambican firms.

Policies aimed at the diffusion of information regarding best practices in management across sectors can be the first step towards improving management practices.

1. Creating Management Demonstration Projects, providing a live classroom, show-

casing modern management techniques which can be observed and learned from, enabling managers to envision ways to incorporate modern management techniques in their own firms. Successful examples include the US Agriculture Extension Program and the Japanese Industrial Program.

2. Helping managers critically evaluate their own practices in a non-threatening way would be particularly beneficial. For instance, the 2013 South African Excellence Model is a diagnostic measurement tool recently developed in South Africa (based on the Management Excellence Model (MEG), a business management system disseminated in Brazil by the National Foundation Quality (FNQ)) that allows organisations to do a regular self-assessment of their performance, identifying performance strengths and areas for improvement. The tool has been tailored to the African context and will be used by the South African Excellence Foundation (SAEF) to help firms assess their own management practices.
3. Holding workshops about best practices. Officials could provide opportunities and promote events to collaborate and share best practices techniques and learning with multiple methods to support the implementation of such practices. Other points include creating easy-to-read publications to disseminate latest best practice developments and giving managers a “basic tool pack” to help them get started (for instance, include an example of a basic profit and loss statement, or inventory checklist, or guidelines for developing effective targets). The score for firms in Mozambique are low enough that even these basic and non-capital-intensive changes could make a large difference.

5.2 Concluding remarks

Using a unique dataset evaluating the quality of management practices in firms across Mozambique, we present the first snapshot of manufacturing management in the country. We broadly find Mozambican management practices are, on average, poorer than in the

other countries we have surveyed, but with encouraging signs. The spread of management practices within Mozambique is wide, suggesting there is certainly room for improvement that is implementable in the Mozambican context.

If we accept the link between firm management and productivity, these findings suggest that poor management practices could be a factor behind the lower levels of productivity in many countries. This is also an opportunity for policy development: many improvements in management practices can be effected with relatively low capital investment, which is particularly important in middle-income economies. Understanding the drivers of better management in establishments is a fruitful area for policy development.

The main policy relevance of this academic work stems from the fact that many of the best practice management changes do not require a high level of physical capital investment, but rather an investment on the part of the owners/managers to drive a deep culture change within their firm to change the managerial *processes* in place.

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6 Appendix A: Measuring management practices

6.1 Building a sampling frame & maximizing response rates

Given the lack of a publicly available list of firms in the manufacturing sector from which to draw our sampling frame, we constructed the sampling frame using several online sources and documents from different entities. Our sampling frame includes lists from the Ministry of Commerce and Industry, The Mozambique and Portugal Business Chamber, The Mozambique Exporters Directory, Facim, Acismoz, the USA Embassy in Maputo, and online business directories. We began by searching for phone numbers for all the firms and built a sampling frame of firms which we could confirm were active, manufacturing, and had working phone numbers. Our current sampling frame has 198 companies employing between 50 and 5000 employees in the manufacturing sector in total. Of these firms, we were able to contact and interview 108.

Particularly given our limited sampling frame, we are encouraged by our very high response rate. Table 1 shows the survey response rates in Mozambique. “Scheduling in progress” indicates firms which have been contacted by an interviewer and which have not refused to be interviewed (for example they may schedule an interview but cancel or postpone it or simply take more time to respond). The high share of “scheduling in progress” firms was due to the need for interviewers to keep a stock of firms to cycle through when trying to arrange interviews. As the analysts conducted on average 1 interview per day, the majority of their time was spent trying to contact managers to schedule future interviews. Unfortunately, the survey ended before these managers could be interviewed, which left large stocks of initially contacted firms without possibility of following up but were still considered under the “scheduling in progress” category.

Table 1: Response Rates

Sampling frame	# of firms	Share
Interview conducted	108	54.54%
Scheduling in progress	51	25.76%
Interviews refused	32	16.16%
Not yet eligible	7	3.53%
Total	198	100%

1) “Interviews completed” reports all the companies contacted for which a management interview was completed.

2) “Scheduling in progress” reports all the companies contacted with no interview run nor any manager refusing to be interviewed.

3) “Interviews refused” reports all companies contacted in which the manager refused to take part in the interview.

4) “Not yet eligible” reports all companies contacted in which the manager has been in the company for less than one year.

6.2 Obtaining interviews with managers

We used a variety of procedures to obtain a high response rate and to remove potential sources of bias from our estimates. First, we monitored interviewers’ performance in contacting firms and scheduling interviews. The interviewers were encouraged to be persistent, that is, they run on average one interview a day lasting approximately 58 minutes each and spend the remainder of their time repeatedly contacting managers to schedule interviews. Second, we presented the study as a “piece of work” (never using the word “survey” or “research”) and the interview as a confidential conversation about management experiences, starting with non-controversial questions on management practices within the firm. Third, we sent informational letters, and, if necessary, copies of a World Bank endorsement letter as well.

6.3 Collecting accurate responses

During the interview itself, we used a double-blind technique by:

1. Conducting a telephone survey without informing the managers that their answers would be evaluated against a scoring grid and thus, gathering information about ac-

tual management practices (as opposed to managers aspirations, perceptions and interviewer's impressions).

2. Not informing the interviewers about the establishment's performance. Interviewers are only provided with the establishment's name and telephone number.

We also follow several other steps to guarantee the quality of the data such as:

3. Asking open-ended questions until an accurate assessment of the actual management practices could be made, for example, on the first performance monitoring dimension we start by asking the open question "what kinds of indicators do you use for performance tracking", rather than closed questions such as "do you use indicators for performance tracking" which may lead to a yes/no answer. The second question on the performance monitoring dimension is "how frequently are these measured? Who gets to see this data?" and the third is "If I were to walk through your plant could I tell how your are doing against your indicators?" The combined responses to this dimension are scored against a grid which goes from 1, defined as "Measures tracked do not indicate directly if overall business objectives are being met. Tracking is an ad-hoc process (certain processes aren't tracked at all).", up to 5, defined as "Performance is continuously tracked and communicated, both formally and informally, to all staff using a range of visual management tools." The interviewers are also encouraged to ask follow-up questions beyond the ones we give them as guides, whenever necessary.
4. Ensuring that each interviewer conducted a minimum amount of interviews in order to correct any inconsistent interpretation of responses.
5. Double-scoring, i.e, having another interviewer silently listening and scoring the responses provided by the managers during the interview to be discussed with the primary interviewer.
6. Collecting a series of noise controls on the interview process itself (such as the time of

day and the day of the week), characteristics of the interviewee and the identity of the interviewer. We include these controls in the regression analysis to help improve the precision of our estimates by reducing some of the measurement error.¹⁰

¹⁰To check the methodology at the project's inception, in the 2006 manufacturing wave we re-surveyed 5% of the sample collected using a second interviewer to independently interview a second plant manager in the same firm. Two independent management interviews on different plants within the same firms should help to reveal how consistently we are measuring management practices within that firm. In the sample of 222 additional interviews, we found that the correlation of the score between our independently run first and second interview was 0.51. Part of this difference across plants within the same firms is likely to be real internal variations in management practices, with the rest presumably reflecting survey measurement error. However, the correlation across the two interviews is highly significant (p-value 0.001). This suggests that while some substantial noise exists in our interview process there are significant differences in management quality across firms.

7 Appendix B: Examples of management practices

7.1 Lean Operations

Best practice example: Lean processes are fully implemented across all areas of the firm, and have been in place for several years. Lean is part of the culture of the company, and was introduced as a means of achieving the business objectives of the company and thus be the best in the industry. The employees of the firm constantly analyse the production process as part of their normal duties. Critical areas of production are thoroughly analysed in regular meetings aimed at the continued improvement of processes in the firm. Every problem is registered in a special database that monitors critical processes and each issue must be reviewed and signed off by a manager.

Intermediate example: The firm has introduced some lean processes, but these are limited to a certain area in the firm, or are in start-phase. The implementation of such processes is geared towards reducing costs, and thus increasing the efficiency of the production process. Employees identify problems in the production process, and possible solutions are discussed in regular meetings involving employees and a manager.

Weak example: The firm has not introduced any lean or modern processes, retaining a traditional form of management. The firm has no formal or informal mechanism in place for either process documentation or improvement. The manager mentioned that production takes place in an environment where nothing has been done to encourage or support process innovation.

7.2 Performance Management

Best practice example: The firm tracks performance using a good range of indicators, which are measured formally and continuously. Records are updated automatically in computer systems which all staff can access. Various visual systems around the plant allow staff to check their performance against the indicators. Performance is reviewed is regular

meetings involving the senior management, resulting in action plans for each issue raised in the meetings. The results of all meetings and the details of actions plans are communicated to all staff. Action plans are monitored continuously to ensure adequate progress.

Intermediate example: The firm has a range of performance indicators that are tracked daily and measured in regular meetings involving the senior management. Staff has access to performance data, which is published on the company server. This is updated monthly. The manager responsible regularly checks up action plans resulting from these meetings, with action taken to rectify potential problems.

Weak example: The firm tracks its performance using only volume as an indicator. Senior management sees this data, but it is not communicated to the rest of the staff. Performance is reviewed informally, with meetings being called to deal with specific problems in production. Little or no action is taken to rectify problems or delays in a plan.

7.3 Target Management

Best practice example: The firm has a good balance of financial and non-financial targets which are considered key to the long-term success of the firm, and which are regularly revised to reflect economic changes and ensure achievability. These goals are cascaded through the firm down to the individual worker. The goals and targets are clearly communicated to encourage individual workers to compare their performance against their targets and to encourage competition.

Medium example: The firm has some concrete non-financial goals that form part of the managers appraisal, but these are not a priority. Performance measures and targets are clear and are broken down to department level. Targets are set taking into account a variety of factors that will affect their achievability, such as availability of raw materials and machine capability. Team or department performance is made public and is accessible to all staff.

Weak example: The firms goals are exclusively financial and operational, and are largely of a short-term nature. The firm has general goals that are not cascaded down through the

firm, staff being mostly unaware of their targets. Targets are generally surpassed, and are set based on the managements experience.

7.4 Talent management

Best practice example: Attracting and developing talent at all levels of the firm is formalized through targets and rewards. Both managers and non-managers are paid on a performance basis, and are given both financial and non-financial rewards for achieving their targets. Regular reviews are in place to assess each individual employees performance, and identify the best and worst performers. Underperformers are put on performance improvement plans immediately. The best performers are given personalized career plans to develop the skills necessary for growth within the firm. The firm has a policy of offering the best opportunities for top performers within the firm, as well as for top prospective employees.

Medium example: Senior management in the firm believes that attracting and developing talent is important, but managers are not held accountable for it. All staff are regularly evaluated and are paid based on their individual performance. Underperformers are identified through these reviews and are removed or moved to less critical positions in the firm. The best performers are identified, and are identified as potential candidates for promotion.

Weak example: The firm has no system to attract or develop talent. Both managers and workers are paid equally regardless of their performance and there are no consequences for poor performance beyond some disciplinary measures (workers are never fired). The firm has not got a promotion system in place as there is very little room for growth and no one has been promoted in years.

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