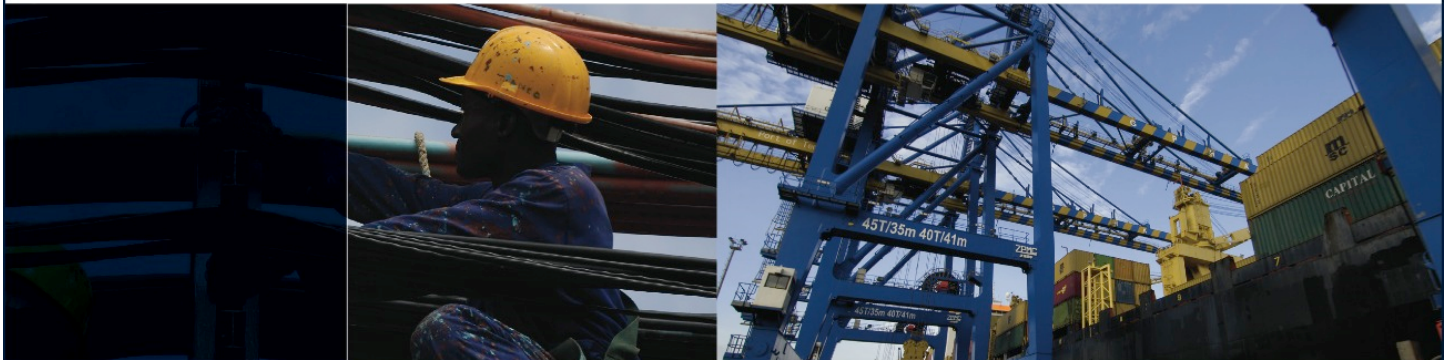# LEARNING TO COMPETE

How Many Manufacturing Firms are There in Mozambique?

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Abstract

This paper addresses the issue of poor data on Mozambican manufacturing firms. A new dataset (the merged manufacturing database) is merged from provincial industrial databases from each of Mozambique's 11 provinces. The new dataset is assessed by comparing it to the latest manufacturing enterprise survey as well as the latest firm census. The merged manufacturing database is found to provide a somewhat accurate picture of small, medium, and large firms, but many micro enterprises are not found on the list. Realizing this, the population of manufacturing firms in Mozambique by size and province is estimated using imputation methods. Finally, the degree of representativeness of the two latest enterprise surveys (IIM2012 and the survey used for the latest investment climate assessment) is revisited using the new population estimate.

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1   Introduction

Since the end of the destabilization war in 1992, Mozambique's economy has been growing at a rapid pace, averaging around 7 per cent annual growth. While the growth has been impressive, the inclusiveness of the growth has been less so. Following fast reductions in poverty rates in the first decade after the war, the poverty reduction has stagnated in the new millennium (DNEAP 2010). An important explanation for this is the lack of structural transformation (i.e. widespread movement of the labour force from subsistence agriculture to modern industry, services, and agriculture) in the economy, as documented by e.g. Jones and Tarp (2012).

The manufacturing sector is regarded as a key driver of structural change both theoretically and empirically (see e.g. Lewis 1954), but in the last decade, the Mozambican manufacturing sector has been growing at rates hardly exceeding population growth, as evident from Figure 1.

Figure 1: GDP, manufacturing GDP, and population growth 2005-11, yearly change in %
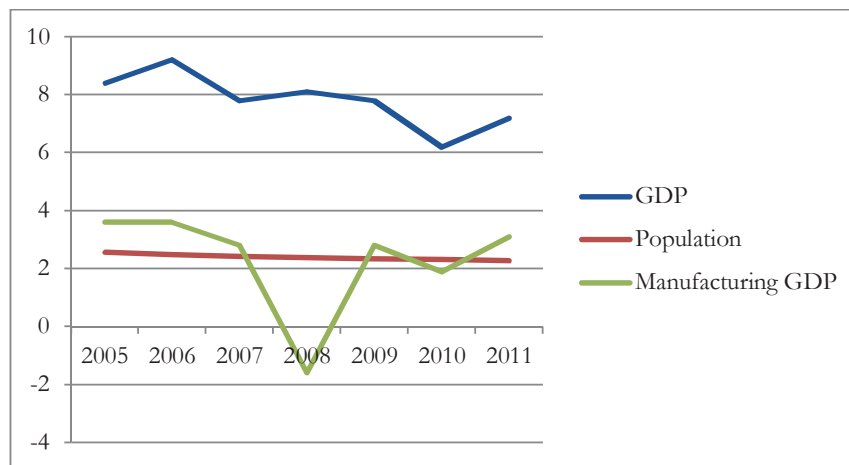
Source: KPMG (2011) using PES balances, the PES 2013 proposal (GoM 2012) for GDP and manufacturing GDP numbers, World Development Indicators for population growth (World Bank 2013a).

On paper, the Mozambican government acknowledges the importance of the manufacturing sector in the country's development plans – see e.g. the Industrial Policy and Strategy (GoM 2007), The Poverty Reduction Action Plan for 2011-14 (GoM 2011) and the Economic and Social Plan (GoM 2010). In practice, on the other hand, there may be room for improvement in the design and implementation of industrial policy in Mozambique, as noted by Krause and Kaufmann (2011).

An important prerequisite for designing and implementing an effective and well-targeted industrial policy in a given country is an overview over which companies operate in the country. However, during the implementation of the latest manufacturing enterprise survey in Mozambique (IIM2012; DNEAP 2013) it became apparent that the existing census data is a rather inaccurate description of the actual population of Mozambican manufacturing firms. Furthermore, there is no coherent national database of manufacturing firms.

A consequence of this is that sampling in the latest couple of manufacturing surveys – the 2009 Mozambique Enterprise Survey,[1] used in the 2009 Investment Climate Assessment (World Bank 2009; thereafter MES2009) as well as the aforementioned 2012 Manufacturing Enterprise Survey (IIM2012) – was not based on reliable population data, making it impossible to assess representativity of the surveys. This has consequences for the validity of inferring from the surveys to the population of manufacturing firms.

This paper addresses the issue by compiling industrial databases from Mozambique's 11 provinces into a new national dataset of manufacturing firms; the merged manufacturing database (MMD). Acknowledging that even this dataset is not a complete list, we attempt to impute the population of manufacturing firms in Mozambique, triangulating the national database with the IIM2012 and other sources. Using this population estimate, we then proceed to evaluate the representativeness of the MES2009 and the IIM2012.

In addition to providing a general overview of the population of manufacturing firms to inform policy makers, the new database can be used to assess the representativeness of surveys (e.g. IIM2012) and to help design sample frames for future surveys. Moreover, improved firm population data can be helpful in the efforts of analysing industrial clusters in Mozambique.

While the issue of business licensing and registration from the point of view of the businesses is of great importance (see for example the 'Doing Business' studies of the World Bank 2013b), the main focus here is the administrative overview of the manufacturing firm population. In addition, since the authorities by definition do not register informal firms, we will focus exclusively on formal firms in the following.

The rest of the paper is structured as follows. In the next section, the industrial classification system in Mozambique is presented and the data used in the paper is described. In the third section, the MMD is validated and some comments on the industrial classification system are provided. In Section 4, the number of manufacturing firms by province and size is estimated. Section 5 assesses the representativeness of the MES2009 and IIM2012 surveys and Section 6 concludes.

2   Data description

Registration of manufacturing companies in Mozambique is in principle governed by Decree 39/2003 of 26 November 2003 (GoM 2003). Decree 39/2003 classifies industrial establishments in four classes (micro, small, medium, and large companies) according to three criteria (initial investment, installed electrical capacity, and number of workers) as apparent from Table 1.

Registration of medium and large enterprises is the responsibility of the Ministry of Industry and Trade (MIC) through the National Directorate for Industry (DNI); registration of small enterprises is the responsibility of the provincial governors (in reality the provincial directorates for industry and trade, DPICs); while the micro enterprises are registered by the district authorities. Small, medium, and large enterprises must be authorized, while micro firms only need to be registered. Micro companies operating in the food or pharmaceutical industries also need authorization to operate (GoM 2003).

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[1] The MES also contains non-manufacturing companies, but they are excluded in our treatment here.

Table 1: Classification of industrial establishments in Mozambique

Category	Initial investment (1,000 US$)	Installed electrical capacity (KvA)	Number of workers
Micro	<25	<10	<25
Small	25-2,500	10-500	25-124
Medium	2,500-10,000	500-1,000	125-250
Large	>10,000	>1,000	>250

Note: If a company is of category x according to two criteria and of category y according to the third, it is classified as category x. If a company is of three different categories according to the three criteria, it is classified as being in the middle category.

Source: GoM (2003).

The DPICs must maintain a database of industrial establishments in the province and must update MIC every three months. MIC, in turn, is responsible for maintaining a nationwide database. However, there is presently no coherent reporting mechanism between the DPICs and MIC, so there is no updated database at the national level. The closest thing to a nationwide database is the 2011 revision of the 2002 firm census (the CEMPRE in INE 2011). However, during the implementation of the IIM2012 survey, it was found that the 2011 revision was a rather poor description of the actual population of Mozambican manufacturing firms as it contains many entries of firms not in operation and also lacks many firms actually in operation.

Faced with this data issue, we requested the national database of medium and large firms from DNI as well as the databases from the provinces, either by showing up in person (Maputo City, Maputo Province, Gaza, Sofala, Tete, and Nampula) or by contacting the DPICs via email (the rest of the provinces). These lists were collected from July 2012 to May 2013.

First, provincial datasheets were cleaned, duplicates and enterprises with a 'closed' or 'paralyzed' status were removed and formats were aligned to the extent possible. Information about industrial sector was used to classify the companies according to the Mozambican CAE (rev. 2) classification of economic activities (Classificação de Actividades Económicas; INE 2008). Non-manufacturing enterprises were removed (163 in total, especially salt extraction facilities, mechanics, and funeral agencies) and 62 observations with no information about firm size were also removed. Finally, the provincial lists (as well as the national database of medium and large firms from DNI) were merged into one national list with 3,230 manufacturing firms (the MMD).

3   Assessment of the merged manufacturing database

Having created the MMD from rather disparate components, a key question is to what extent it constitutes an exhaustive list of Mozambican manufacturing firms. In particular, one might have two worries. One concern is that because of inadequate resources and little or no co-ordination with other government entities, the DPICs may fail to register a number of firms, especially smaller firms. A related concern is that the quality and comprehensiveness might differ substantially between provinces for the same reasons.

Given the data scarcity, assessing the MMD is not straightforward. The strategy chosen here is to compare the MMD to two other data sources, namely the CEMPRE and the IIM2012. Compared to the MMD, they each have a distinct attribute that we will use in the following. While the CEMPRE might constitute a rather inaccurate list of firms in operation today (in particular, it might be outdated), it is at least more likely than the MMD to have been collected in a consistent fashion across provinces.

And while the dataset from the IIM2012 makes no claim to be comprehensive, we can at least be sure that entries in it represent actual companies – and since the firms in IIM2012 are companies founded before 2010 still in operation in 2012, they should be registered by the DPICs.

3.1 Comparing the MMD to the CEMPRE

While the growth in Mozambique's manufacturing GDP has been lacklustre over the last decade, it has been positive almost every year. Combined with a substantial population increase, it seems unlikely that Mozambique should have fewer manufacturing firms now than in 2002. Hence we should expect the MMD to have at least as many firms in each province and size category as the CEMPRE.

Table 2 compares the MMD and the CEMPRE with regard to the number of firms in different size categories in each province. To keep numbers consistent, firm size is based on number of workers in the following; when number of workers is not available, size is based on reported firm size category (micro, small, medium, and large).[2] Basing the table on reported firm size for all observations instead makes no qualitative difference; as a robustness test, the same table made using reported firm size is presented in Table A1 in the Appendix.

Table 2: Number of firms on lists and census by size and province (based on number of workers)

	Micro		Small		Medium		Large		Total	
Province	Lists	Census	Lists	Census	Lists	Census	Lists	Census	Lists	Census
Niassa	339	137	3	2	1	1	0	0	343	140
Cabo Delgado	133	102	8	11	0	0	3	3	144	116
Nampula	511	202	68	19	8	7	11	5	598	233
Zambézia	76	88	14	13	3	0	3	4	96	105
Tete	28	126	12	4	0	0	1	1	41	131
Manica	35	290	18	16	2	3	4	3	59	312
Sofala	41	583	69	27	1	2	4	3	115	615
Inhambane	192	131	25	14	0	1	0	0	217	146
Gaza	221	208	11	13	2	0	0	1	234	222
Maputo province	303	220	74	79	7	8	7	6	391	313
Maputo city	766	783	210	106	10	14	6	9	992	912
All	2,645	2,870	512	304	34	36	39	35	3,230	3,245

Source: Own calculations using data from the MMD and CEMPRE.

When it comes to listing micro firms, the lists differ a lot. The lists from two provinces (Manica and Sofala) do not contain firms labelled as micro at all (using the definition from GoM 2003; see Table A1 in the Appendix). The census has vastly more micro firm entries than the lists in Tete, Manica, and Sofala and vastly fewer in Niassa and Nampula. At a worldwide level, 83 per cent of the MSME[3] population are micro firms[4] (Kushnir et al. 2010). This seems to fit roughly with the lists from Niassa,

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[2] Hence, a firm is micro if it has less than 25 workers; small if it has 25-124 workers; medium if it has 125-250 workers, and large if it has more than 250 workers.

[3] Micro, small and medium sized enterprises.

[4] With a threshold between micro and small firms set at ten employees.

Cabo Delgado, Nampula, Inhambane, and Gaza that all have more than 85 per cent micro firms. However, the lists from Zambézia, Tete, Maputo province and Maputo city contain less than 80 per cent micro firms. The comprehensiveness when it comes to including micro companies on the lists thus varies substantially. Furthermore, the numbers suggest that at least some of the micro companies in existence do not appear on the lists of Zambézia, Tete, and Maputo province and that many of them do not appear in the lists from Manica and Sofala. Overall, it does not seem that the MMD is fully inclusive when it comes to micro manufacturing firms.

With regard to small firms (25-124 workers), the situation is different. In half the provinces (Niassa, Zambézia, Manica, Gaza, and Maputo province) the number of small firms is almost the same on the lists as in the census, but in the remaining six, it is substantially higher. The fact that no list has substantially fewer small firm entries than the census is taken to indicate that none of the lists systematically fail to register small companies. On the other hand, the larger number of small firms in the MMD compared to the CEMPRE is taken to indicate that the number of small manufacturing firms in Mozambique is larger than indicated by the CEMPRE.

The census and the lists largely agree on the number of medium and large firms, so the registration of these is not deemed to differ too much across provinces. This is likely to be a consequence of the data on medium and large firms being collected by one institution nationally, the DNI.

3.2 Comparing the MMD to the IIM2012

Since we know that all the firms in the IIM2012 exist or at least did so in 2012, it is interesting to investigate how many of the firms surveyed in the IIM2012 that appear in the MMD. The IIM2012 encompasses all provinces but Niassa, Cabo Delgado, Zambézia, and Inhambane. Table 3 displays the proportion of firms in the IIM2012 that are also present on the lists by province and firm size.

Table 3: Proportion of firms in the IIM2012 that are also present on the provincial lists, in %

	Informal		Micro		Small		Medium and large	
Province	%	No. of obs*	%	No. of obs*	%	No. of obs*	%	No. of obs.*
Maputo city	3.6	56	26.8	153	68.6	51	75.0	8
Maputo province	0.0	8	5.4	37	43.5	23	100.0	1
Sofala	2.3	43	11.5	87	69.2	13	-	0
Nampula	6.7	15	27.5	40	100.0	12	80.0	4
Manica	0.0	8	8.6	70	71.4	7	-	0
Tete	0.0	4	11.1	45	100.0	3	-	0
Gaza	0.0	32	11.4	35	100.0	5	100.0	1
Total	2.4	166	16.9	467	69.3	114	78.6	14

Note: * No. of obs. refer to the number of firms of the given size in the IIM2012 data.

Source: Own calculations using data from the MMD and IIM2012.

First of all, informal companies (defined in the IIM2012 as having no taxpayer number) are very unlikely to appear, which was expected as informal firms by definition are less likely to be registered by government. Second, provinces differ a lot with regard to how often micro companies are listed. In Nampula and Maputo city, a little over a quarter of the companies interviewed in the survey are found in the MMD; this figure is lower than 12 per cent in the rest of the provinces and less than 9 per cent in Maputo province and Gaza. Small companies are registered in all cases in Nampula, Tete, and Gaza and

in more than two thirds of the cases in the rest of the provinces except Maputo province. Medium and large companies are almost invariably registered. This is taken to indicate that – albeit with differences across provinces – the MMD is fairly comprehensive when it comes to registering large, medium, and small companies, but fairly unreliable when it comes to registering micro firms.

3.3 The Mozambican industrial classification system revisited

Having assessed the MMD resulting from the DPIC lists, some comments on the Mozambican industrial classification system are in order, as the institutional set-up of firm registration could be an important explanation for the lack of a reliable manufacturing firm database.

Kushnir et al. (2010) provide a comparison of MSME registration across 132 countries. They find that most countries base their classification solely on number of employees – the ones that use additional parameters often use annual revenue or investment. In addition, they find that most countries have thresholds between micro, small, medium, and large companies at 10, 50, and 250 employees respectively. Some African countries have placed the threshold between micro and small firms at five employees (e.g. Botswana, Ghana, Malawi, and Nigeria). Both of these observations indicate that Mozambique's system of industrial classification is somewhat of an outlier, including relatively large firms in the micro firm category.

Basing firm size categorization on three parameters is adding a layer of complexity that does not seem to be merited by additional advantages. Placing importance on electrical capacity causes firm size categorization to depend on choice of energy source, meaning that firms that get energy from another source (e.g. firewood, fossil fuels, or solar power) will be classified as smaller, which might not be appropriate. Placing importance on *initial* investment also means that an expansion of an existing company will not increase its size according to the investment parameter, which also is not appropriate.

Instead, a sound and simple strategy would be to base firm size classification exclusively on the number of (full time) workers employed. This would make the system much simpler to operate, and since firms of different sizes are registered by different official entities, it would create less confusion about the jurisdiction of firm registration. It would also reduce the need for tedious recalculations on behalf of the registration bodies when parameters of firms change. Moreover, adjusting the classification threshold values might make sense as described in DNEAP (2013) since the vast majority of Mozambican businesses have less than 25 workers; moving the micro firm threshold to 10 would create a better overview.

Cutting the other parameters than number of employees and adjusting to the standard Eurostat classification (thresholds at 10, 50, and 250 workers) would also serve to make the classification internationally comparable.

In addition to adjusting the rules for classifying industrial enterprises, it may also be advisable to improve the communication between the different registration schemes. A lot of work has been done to make business registration easier in Mozambique (see e.g. World Bank 2013b), but the system that registers businesses and provides business licenses (alvarás) and tax-payer numbers (NUITs) obviously does not feed into the industrial databases, since so many (especially micro) firms with NUITs surveyed in the IIM2012 do not appear on the provincial lists. Aligning the NUIT system with the industrial registration system and letting both feed into a national database of manufacturing companies is likely to substantially improve the overview of the firm population for policy makers.

Having assessed the MMD and commented on the Mozambican industrial classification system, the question of the number of manufacturing firms will be addressed in the next section.

4   Assessing the number of manufacturing firms in Mozambique

In Section 2, it was described how the 11 provincial lists were merged into a national database of 3,230 enterprises. This is in the same ballpark as the 3,245 manufacturing firms in the updated 2004 census or the 2,697 firms in the Estatísticas das Empresas 2009 (INE 2012).[5] However, it was also emphasized that the national list constructed here should not be thought of as complete. In a household survey from 2008/2009 (the IOF; INE 2010) there were 44 observations of people self-employed in the manufacturing sector (meaning 44 people in the survey owned manufacturing firms). Using the appropriate household weights, this translates into 24,731 manufacturing firms. This figure is of course highly uncertain and most of these are likely to be tiny, informal operations. However, it still suggests that the real number of manufacturing firms might be higher than the 3,230 indicated by the MMD.

Since there does not seem to be any solid official statistics for the total number of firms, we have to estimate it. In Table 3 it was shown that provinces are very likely to have registered large or medium companies, slightly less likely to have registered small companies and quite unlikely to have registered micro companies. In this exercise we assume that the firms in the IIM2012 survey were selected at random, so if 25 per cent of the surveyed firms in a certain category are on the list, it means that only 25 per cent of the province population of firms in that category are registered on the lists.

Large companies are assumed always to be registered (the only large company in the survey is). Medium companies are assumed to be registered with the overall registration rate of medium firms in the IIM2012, namely 76.9 per cent. Small firms are assumed to be registered with the provincial registration rate (in the cases of provinces featuring in the survey) or with the overall registration rate of small firms in the IIM2012, namely 69.3 per cent (in the cases of provinces not featuring in the survey).

Since no province had registered more than 30 per cent of the surveyed micro firms and since two provinces do not register micro firms at all (Sofala and Manica), the number of micro firms is very uncertain. We attempt to provide an estimate by first calculating the ratio of micro firms to non-micro firms (using the same procedure as for small firms, but subtracting a third because some surveyed firms might be present on the lists but in unrecognizable form[6]) in the provinces with the highest number of observations among the provinces registering micro firms: Nampula (13.9) and Maputo city (5.9). We then assume that the average of these (9.9) is the ratio of micro firms to non-micro firms in all provinces, an admittedly heroic assumption. This corresponds to micro firms constituting 90.8 per cent of the manufacturing firms in Mozambique which is comparable to the 85 per cent found by Kushnir et al. (2010) for a range of developing countries, using a threshold between micro and small firms of ten employees.

Assuming these registration rates, the manufacturing firm population by province and firm size come out as displayed in Table 4. The total number of firms is estimated at 9,203 or some three times the number of firms in the CEMPRE or the 2009 Estatísticas das Empresas (INE 2012).

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[5] Interestingly, the Estatísticas das Empresas 2008 states that there were 2,696 manufacturing firms in 2008 – meaning that, according to this source, the difference between 2008 and 2009 is one (1) firm.

[6] And hence we would have failed to register that a firm was present in both databases.

Table 4: Estimated number of firms by size and province using survey database correspondence

	Micro	Small	Medium	Large	Total
Niassa	56	4	1	-	61
Cabo Delgado	143	12	-	3	158
Nampula	881	68	10	11	971
Zambezia	267	20	4	3	294
Tete	128	12	-	1	141
Manica	314	25	3	4	345
Sofala	1,035	100	1	4	1,140
Inhambane	356	36	-	-	392
Gaza	134	11	3	-	148
Maputo province	1,837	170	9	7	2,023
Maputo city	3,205	306	13	6	3,530
Total	8,356	764	44	39	9,203

Note: Assuming 9.9 micro firms per non-micro firm in all provinces.

Source: Own calculations using data from the MMD and IIM2012.

The estimates for micro firms are of course highly uncertain and heroically assume that all provinces have the same ratio of micro to non-micro firms. However, as the vast majority of small, medium, and large firms in the IIM2012 data were also found in the MMD, the numbers of non-micro firms are more reliable. The estimate above has about the same number of large firms, slightly more medium-sized firms and two and a half times as many small firms as the CEMPRE. Interestingly, the proportion of micro firms in the CEMPRE (88.4 per cent) is almost identical to the estimated proportion here (90.4 per cent).

More than 60 per cent of the companies in the estimated population are in Maputo city and Maputo province and more than 80 per cent are in these provinces plus Sofala and Nampula. This confirms that manufacturing firms in Mozambique are rather concentrated in a few locations.

In the next section we use this estimate for the manufacturing firm population in Mozambique to evaluate the representativeness of two recent manufacturing enterprise surveys: the MES2009 and the IIM2012.

5   Evaluation of survey representativeness

Sampling in the MES (2009) was conducted on the basis of a list of firms joined from a variety of sources (eight different, including the CEMPRE). The list included 15,546 companies, both manufacturing and other firms of which 1,163 had more than five employees. The 599 surveyed companies (358 manufacturing) in the final dataset were all from the cities of Maputo, Matola, Beira, and Nampula. The survey makes no claim to be representative of any specific group of companies.

In the IIM2012, the sampling strategy employed was an attempt at stratification by location, using the CEMPRE as the foundation. The ten cities (in seven provinces) with the largest manufacturing populations were selected and the number of firms in each province was proportionate to the number of firms in that province in the CEMPRE. The final dataset consisted of 761 firms from Maputo City, Maputo province, Gaza, Sofala, Manica, Tete, and Nampula. The surveyed firms were not selected from the CEMPRE, because most of the firms in the CEMPRE were unidentifiable on the ground, but

were instead sampled using a snowball method. The IIM2012 does also not claim to be representative of a specific group of firms in any strict sense.

Even if the MES2009 and the IIM2012 do not make any claims to representativeness, it is still interesting to compare the datasets of surveyed firms to the MMD, both when it comes to size and location. Table 5 shows the proportion of firms by province in the MES2009, the IIM2012, and the MMD estimate.

Table 5: Proportion of firms by province for MES2009, IIM2012, and MMD-based estimate

	MES2009	IIM2012	MMD-based estimate
Niassa	-	-	0.7
Cabo Delgado	-	-	1.7
Nampula	10.3	9.3	10.6
Zambezia	-	-	3.2
Tete	-	6.8	1.5
Manica	-	11.2	3.7
Sofala	6.7	18.8	12.4
Inhambane	-	-	4.3
Gaza	-	9.6	1.6
Maputo province	12.0	9.1	22.0
Maputo city	71.0	35.2	38.4

Note: Numbers indicate percentages.

Source: Own calculations using data from MES2009, IIM2012, and the MMD.

As mentioned before, the MMD-based estimate finds almost 40 per cent of the country's manufacturing firms to be in Maputo city and more than 83 per cent to be located in the four provinces of Maputo city, Maputo province, Sofala and Nampula. Compared to this, the MES2009 seems to substantially oversample Maputo city, sample Sofala and Nampula to about the right extent and substantially undersample Maputo province. On the other hand, IIM2012 gets the sampling of Maputo city and Nampula about right, but undersamples Maputo province and oversamples Sofala and especially Tete and Gaza.

Overall, the focus in the two samples on the major population centres (Maputo, Beira, and Nampula) seems to be justified, especially when considering the cost of surveying many localities, meaning that the IIM2012 would have been more representative by sampling fewer firms in Tete, Manica, and Gaza. On the other hand, the MES2009 is too concentrated on Maputo city and would have been more representative by interviewing fewer companies there.

Table 6 displays the proportion of firms by size category in the MES2009, the IIM2012, and the MMD-estimate.

As indicated by the table both the MES2009 and the IIM2012 oversample larger companies compared to the MMD-based estimate, even if the latter is uncertain, especially when it comes to micro firms. Comparing the distribution across sizes in MMD to Kushnir et al. (2010), it does not seem too unreasonable though. The MES2009 presumably undersamples micro firms to a greater extent than the IIM2012.

Table 6: Proportion of firms by size for MES2009, IIM2012, and MMD-based estimate

	MES2009	IIM2012	MMD-based estimate
Micro	72.9	83.1	90.8
Small	24.3	15.1	8.3
Medium	1.7	1.7	0.5
Large	1.1	0.1	0.4

Note: Numbers indicate percentages.

Source: Own calculations using data from MES2009, IIM2012 and the MMD.

6 Conclusion

The fundamental issue addressed in this paper is that of inadequate data about Mozambican manufacturing firms. The paper had three purposes: First, industrial databases collected from all 11 provinces were assessed and joined in a merged national database of manufacturing firms. Then, based on this assessment, an estimate of the number of Mozambican manufacturing firms by province and size was provided.

The MMD was assessed by comparing it to the CEMPRE and the IIM2012 by using certain attributes of these two datasets. It was found that while the MMD lists most companies with more than 25 employees, it is rather imprecise when it comes to listing micro firms. It was also found that the quality and comprehensiveness of the MMD varies across provinces. In addition, some comments were provided about the Mozambican system of firm classification. It was concluded that Mozambique makes firm size classification unnecessarily complicated by basing it on three parameters (number of workers, installed electrical capacity, and initial investment) instead of just number of workers and that size thresholds could be adjusted to improve both the overview of Mozambican industrial policy makers and international comparability. Furthermore, it was suggested that Mozambique would gain from increased communication and alignment between its different systems of enterprise registration.

In Section 4, the number of Mozambican manufacturing firms was estimated. The number of small, medium and large firms was estimated by comparing the MMD to the IIM2012 survey to see how many of the observations in the IIM2012 data that were present in the MMD. Using an imputational method, a final estimate was arrived at of 9,203 manufacturing firms. This estimate hinges on a number of assumptions that are not easily verifiable without additional data so the margin of error is considerable. As the estimate is orders of magnitude higher than both the CEMPRE and the Estatísticas das Empresas (INE 2009), it nonetheless seems likely that these existing sources substantially understate the number of manufacturing firms in Mozambique.

The topic of representativeness of the MES2009 and the IIM2012 was treated in Section 5, where it was found that – with the caveat that the MMD-based estimate was uncertain – the MES2009 oversamples firms from Maputo as well as undersamples micro firms and the IIM2012 oversamples Tete, Manica, Sofala, and Gaza while also undersampling micro firms, albeit to a lesser extent than the MES2009.

It remains a challenge for Mozambique to attract large, productive enterprises as well as to make it as easy as possible for micro and small firms to grow into large, successful businesses. To address this challenge, Mozambique needs industrial policy. It is hoped that this paper can contribute in this respect

by providing policy makers with a better overview of the population of Mozambican manufacturing firms.

Appendix

Table A1: Number of firms by reported size and province (based on Mozambican classification)

	Micro	Small	Medium	Large	Size missing	No. of obs.
Niassa	338	1	1	0	3	343
Cabo Delgado	118	21	3	1	1	144
Nampula	472	113	9	4	0	598
Zambézia	54	40	2	0	0	96
Tete	18	19	0	1	3	41
Manica	0	58	0	1	0	59
Sofala	0	103	0	6	6	115
Inhambane*	0	0	1	0	216	217
Gaza	214	19	1	0	0	234
Maputo province	172	191	11	9	8	391
Maputo city	499	453	15	2	23	992
All	1,885	1,018	43	24	260	3,230

Note: * The list from Inhambane does not record size classification, but the list of medium and large firms from DNI does.

Source: Own calculations using data from the MMD.

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