MER Sector Enterprise Survey

Survey Methods

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1. Introduction

The MER Sector Enterprise survey leverages off prior work by Allen Whitehead & Bhorat (2021), which examines the economic complexity of the MER sector, and then identifies feasible product-level industrial diversification opportunities that have the potential to build economic complexity within the sector. These product-level industrial diversification opportunities are termed, frontier products. The core purpose of the survey is to obtain quantitative information on the factors constraining both the, expansion of, and diversification into, frontier products. Specific focus is placed on the role of skills as a constraint to industrial diversification. Further, the research also a seeks to disentangle the extent to which these constraints impact SMMEs differentially from large firms, and thus provide policy input that may encourage the expansion of SMMEs in the sector.

In this document we detail the methodology informing the development and implementation of the MER Sector Enterprise survey. The document is structured as follows: First, we review the purpose and design of the survey instrument. Second, we detail the sampling methodology applied to generate a representative dataset from which to analyse the MER sector. Third, we explain the approach to implementation of the survey. Finally, we speak to post-survey adjustments that are applied to ensure the representativity of the captured sample that emerged from the implementation of the survey.

2. Design of survey instrument

The MER Sector Enterprise Survey is an establishment level survey. The development of the survey instrument was an iterative process that drew on the expertise of the core Development Policy Research Unit (DPRU) research team, a team from a survey company responsible for the implementation of the survey, and an academic expert in survey methods. In this section we discuss the development of the survey instrument. We start by providing a rationale for the choice of unit of

[1] This supporting document is referenced in the following working paper: Allen Whitehead, C., Bhorat, H., Hill, R., Köhler, T. and Steenkamp, F. (2022). Expansion and Diversification in the MER Sector: Results from an Enterprise Survey. Development Policy Research Unit Working Paper 202203. DPRU, University of Cape Town.

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analysis. We then discuss the mode of survey and the structure of the survey instrument. The survey was targeted at establishments engaged in manufacturing activity within the MER sector, and as such we discuss the screening questionnaire that ensured that the appropriate unit of analysis was applied. This is followed by a detailing of the types of data collected, which enable the research team to address the objectives of the research study. Finally, we detail the iterative nature of the survey instrument design process and note that the survey instrument and approach has undergone the University of Cape Town's (UCT) ethical clearance protocol.

2.1. Unit of analysis

The survey obtains data from establishments engaged in manufacturing activity. There are two important elements to the defined unit of analysis: First, the survey focused on establishments engaged in manufacturing activity. The broader research project is focused on industrial diversification, and hence emphasis is placed on the manufacture of products, and not the provision of services. This distinction is important because there are numerous firms and/or establishments within the MER sector that are engaged in services, specifically motor retail trade. This issue, and how it relates to sampling, is discussed in more detail in Section 3. Second, the survey captures data at the establishment level. Implementing surveys at the establishment-level is a common approach to conducting firm or enterprise surveys – for example, The World Bank's Enterprise Surveys are conducted at the establishment level.[3] The establishment can be defined as a physical location where business operations are carried out, or in the case of this survey, where manufacturing activity is taking place. The establishment unit fits within the firm unit and thus, there are often instances where multiple establishments reside within a single firm entity – this is defined as a multi-establishment firm. However, there may also be cases where a firm consists of a single establishment – and single establishment firm – and in these instances the firm and establishment are the same entity.

Establishment level enterprise surveys have both their advantages and disadvantages. A key advantage of focusing on the establishment is that the information obtained from the survey pertains to manufacturing activity undertaken by an establishment at a given locality. In the context of this study, this is important because the constraints identified are specific to locality within which the establishment is located, and the manufactured products specific to the establishment. This becomes useful, for example, in the case of skills constraints, because these constraints often play out in local labour markets within which establishments reside. A disadvantage of applying the establishment level approach is that in the case of multi-establishment firms it may at times be impossible to disentangle establishment level information from firm level information. This is particularly evident in the case of financial data, which may only be reported at the firm level.

2.2. Mode of Survey and Instrument Design

The MER Sector Enterprise Survey adopted a combination of survey modes that included telephonic and online interviews.[4] The primary survey mode was to conduct computer assisted telephonic interviews (CATI).[5] This necessitated the development of an electronic survey instrument, which was developed by the survey company employed to conduct the survey. The development of an electronic

[3] Such establishment level surveys include: The various country-specific World Bank Enterprise Surveys; The UK Employer Skills Survey 2019; The eThekwini Large and Medium Manufacturing Firm Survey 2013-2014.

[4] The other main survey mode available to researchers is face-to-face. This mode was not pursued for two reasons: first, it is more costly than the other survey modes, and secondly, the survey took place during the COVID-19 pandemic and as a result face-to-face interviews were not a feasible option.

[5] During the COVID-19 pandemic, the CATI survey mode was applied in other surveys conducted within South Africa, such as the National Income Dynamics Study – Coronavirus Rapid Mobile Survey (NIDS-CRAM), and the Quarterly Labour Force Survey (QLFS).

survey instrument thus allowed for an additional mode or survey – the online survey mode. The online survey mode is typically characterised by low response rates and is thus used in conjunction with either telephonic interviews or face-to-face interviews, or a combination of all three.

The survey instrument was structured into two parts: the first being the screening questionnaire, which is discussed in detail in Section 2.3, and the second, the main survey questionnaire. The latter part was further divided into sections according to area of focus. These include sections on basic firm characteristics; production characteristics; composition of employment and skills of workforce; constraints to current production; constraints to diversification; financial information.

The objectives of the research project necessitated the capture of different sets of information across an establishment (these sets of information are discussed in more detail in Section 2.4). To capture these different sets of information across an establishment, the survey questionnaire would need to be answered by a range of respondents across the establishment. With this in mind, the main part of the survey questionnaire was designed to have separate self-contained sections that could be answered independently and sequentially by these different respondents. For example, the section on production characteristics is answered by the Production Manager, the section on composition of employment and skills of workforce is answered by the Human Resources Manager, and the section on financial information is answered by the Financial Manager. Of course, in smaller establishments, it may be the case that a single respondent within the establishment, such as the Managing Director, is able to answer the entire survey.

The electronic version of the survey instrument is designed with a home page, which lists the main sections of the survey instrument. Further, information on the types of information required in each section and the suggested respondent within the establishment is also detailed. The enumerator can click on each section and work through the questions with the relevant respondent within the establishment. This process can be completed iteratively by the enumerator as s/he is able to engage with the relevant respondents within the establishment. In instances where the respondent establishment completes the questionnaire online, the establishment is provided with a uniquely identified link. This link can then be e-mailed across the establishment to the relevant respondents for each section.

It is worth noting that all respondent establishments can only proceed to the main part of the survey questionnaire after completing the screening questionnaire. We discuss this further in the next sub-section.

2.3. Screening questionnaire

To ensure that the survey captured data according to the defined unit of analysis – establishments engaged in manufacturing activity – a screening questionnaire was developed for respondents to answer before being able to proceed to the main survey questionnaire. The screening questionnaire was designed to address three potential problems: First, we wanted to avoid conducting an interview with a firm's head office establishment where no manufacturing activity is taking place. Second, we wanted to avoid conducting an interview with an establishment not engaged in manufacturing activity. Third, we wanted to avoid conducting and interview with an establishment that is engaged in manufacturing activity, but which does not fall within the MER sector.

The development of the screening questionnaire is necessitated by limitations in the administrative data used to compile the sample frame (this is discussed further in Section 3). The administrative data is primarily recorded at the firm level, and thus the unit of analysis with which the administrative data is recorded does not align with that applied in the survey – the establishment level. The main reason

being that skills development levies are typically paid by the firm and not establishments within the firm. Of course, this is not a concern in single -establishment firms.

It is also a challenge to reliably identify a firm – as recorded in the administrative data – engaged in manufacturing activity. This is the case for several reasons: First, the composition of the MER sector, by construction, includes services industries, such a motor retail trade.[6] Second, at the firm level, a firm may self-identify as a manufacturing firm, and record itself as such in administrative documentation. However, at the establishment level, in the case of multi-establishment firms, it may be the case that an establishment is not engaged in manufacturing activity. For example, the establishment may be a repair centre for a firm that manufactures agricultural machinery and thus provides service repair centres in closer proximity to farmers. Third, it may be the case that firms adjust their activity over time. For example, a firm that previously manufactured certain products but also imported and traded certain manufacturing products, may have adjusted its business model to focus solely on trading activities.

Finally, there are instances where firms in the administrative data are not associated with merSETA. Historically, a firm may have been allocated to the merSETA, but over time it may have found that the activities and requisite skill needs of its workforce align better with an alternative SETA.[7]

Given these limitations, the screening questionnaire was designed as follows: First, the screening questionnaire determined whether the contacted establishment was part of a multi-establishment firm.[8] Second, the screening questionnaire determined whether the establishment, at its current location, was engaged in manufacturing activity.[9] In cases where the respondent indicated that the establishment did not engage in manufacturing activity at its current location, and the establishment fell within a multi-establishment firm, the respondent was then asked whether other establishments within the firm partake in manufacturing activity. If this was the case, then the respondent would be asked to provide information on each of these establishments.[10] In instances where the respondent declared that the establishment engaged in manufacturing activity, the respondent would then be asked whether the establishment belonged to merSETA. Respondents would then be asked which chamber they belonged to within merSETA. If a respondent was not aware of which SETA they belonged to, the respondent would then be asked to state which SIC industry classification best described their

[6] The merSETA Sector Skills Plan 2020-2025 details the scope of industry coverage for the MER sector, and includes the following non-manufacturing industries, as defined by their Standard Industrial Classification (SIC) codes (merSETA, 2019): Building installation (SIC 503) and Building Completion (SIC 504) fall within the metals chamber; Sale of motor vehicles (SIC 631), Maintenance and repair of motor vehicles (SIC 632), Sale of motor vehicle parts and accessories (SIC 633) and Sale, maintenance and repair of motor cycles and related parts and accessories (SIC 634) fall within the Auto Components chamber.

[7] For example, while conducting mini surveys or random selections of firms from the administrative data, the research team came across an instance where a firm engaged in the manufacture of furniture was initially allocated to merSETA because it constructed steel frames for its furniture, but later shifted to an alternative SETA that aligned more closely with the furniture manufacturing industry.

[8] A multi-establishment firm is defined as a firm with several establishments, each with its own location, management, activity, and financial statements. The final unweighted data shows that 68 percent (N=174) of respondent establishments were part of multi-establishment firms, while 32 percent were single-establishment firms (N=80).

[9] As we discuss below in Section 3, 734 respondents completed the screening questionnaire. Of these, 254 indicated that they engaged in manufacturing activity. The other 481 respondent establishments declared that they did not engage in manufacturing activity – i.e. non-manufacturing establishments.

[10] The enumerator would then, through the process of a random draw, select one of these manufacturing establishments, contact them, and reinitiate the survey interview.

manufacturing activity. If none of the industry descriptions applied, then the respondent would be declared a non-MER sector establishment.[11]

At the conclusion of the screening questionnaire, an establishment would be declared a manufacturing establishment belonging to a chamber within the MER sector and could then proceed to the main part of the survey instrument.

2.4. Main questionnaire and types of data collected

The main part of the survey instrument is designed to capture a variety of information from the interviewed establishment. As mentioned above, the types of information the survey aims to capture is informed by the objectives of the research project. This section discusses the types of information the survey instrument was designed to capture. We include a copy of the survey instrument in the Appendix A.

Section A of the survey instrument is designed to capture baseline characteristics of the establishment. This includes the legal status of the firm within which the establishment resides, the location of the firm's head office, the age of the firm, and details on the month and date of the firm's financial year end.

Section B collects information on the current portfolio of manufactured products at the establishment, their share of turnover, whether they are exported, and the total number of destinations they are exported to.[12] This product-level information is later mapped to the Harmonised System (HS) nomenclature for traded products, so that we can identify, based on findings in Allen Whitehead & Bhorat (2021), whether the establishment currently manufactures frontier products.[13] This allows us to link the constraints that the establishment faces – captured in Section D and E of the survey instrument – to these frontier product establishments. This section of the survey instrument also collects information on whether the establishment has internationally recognised certifications, what these certifications are, and whether they enable access to global markets.

Section C captures information on the quantum and composition of employment at the establishment. It is worth noting that employment numbers were obtained for the two pre-COVID years, 2018 and 2019, as well as a measure for the 2020/2021 period. In terms of composition of employment, the instrument can distinguish employment numbers by production versus non-production workers, full-time versus part-time workers, and distribution of employment across 1-digit Organising Framework for Occupations (OFO) nomenclature. Importantly for the purposes of the research project, this section

[11] Of the 254 respondents that indicated that they engaged in manufacturing activity, 252 indicated that they belonged to merSETA. The two respondents that stated that they did not know their SETA, selected MER sector industry descriptions that matched their primary manufacturing activity, and thus fell within the MER sector.

[12] We restrict an establishment to their top five products in terms of share of turnover. The existence of multi-product firms that manufacture a diverse range of products makes this type of question unwieldy, and as such we apply this restriction to our data capture. It is worth noting that in multi-product firms, the most important products in terms of contribution to output account for a disproportionate share of turnover or trade (Bernard, Reddding & Schott, 2010). Thus, while this restriction may potentially omit frontier products, it also ensures that if frontier products are identified, then they are relatively important products in the establishments product portfolio and may have a greater chance of growth.

[13] It is important to note, as done in Allen Whitehead & Bhorat (2021), that there may be some level of production and export of frontier products – i.e. these are not completely 'new products'. However, the revealed comparative advantage measure, used in the complexity and relatedness metrics that are applied to identify frontier products, indicates that the scale of production and export of the product is relatively small. The further intensification of production of a frontier product thus represents an industrial expansion (diversification) opportunity.

poses questions that are directed to uncover the skill needs of establishments, the skills gaps present in establishments, and the skills shortages present in establishments.[14]

Section D of the survey instrument covers constraints to the establishments existing product portfolio. The section begins by enquiring about the existence and severity of a broad set of constraints that establishments may face, with emphasis on whether these constraints inhibit growth of the establishment's current product portfolio. This information allows one to examine whether the constraints facing firms that currently manufacture frontier products differ relative to those not manufacturing frontier products. This can be further interrogated according to firm size – i.e. SMMEs versus large establishments. To unpack further detail on constraints that establishments regard as severe – for example infrastructure constraints – a further set of questions unpack the specific issues associated with a given constraint – e.g. provision and quality of transport infrastructure or cost of transport and logistics infrastructure etc. A final question on what policy recommendations the establishment would suggest to help overcome the constraints that inhibit the expansion of its current product portfolio is posed.

Section E undertakes to determine whether the respondent establishment is seeking to diversify its product portfolio in the next five years. In instances where the establishment aims to diversify, the instrument seeks to gather information on what products it aims to diversify toward. The instrument restricts establishments to their top three products. These products are then mapped to the HS nomenclature, and one can determine whether an establishment seeks to diversify into the frontier products identified by Allen Whitehead & Bhorat (2021). Further information is gleaned from the establishment seeking to diversify with respect to what capabilities it feels would enable such diversification. Emphasis is placed on skill capabilities that would enable diversification. Further queries are made on what constraints would hinder diversification, and what policies would assist in overcoming such constraints.

Section F is designed to obtain financial information from the establishment. Here the respondent was asked for information on financial measures, such as sales, costs of sales, whether a profit was achieved or not, direct labour costs, costs of raw materials, and net book value of property, plant and equipment. A key purpose behind capturing financial information from the establishment is to be able to generate productivity measures, such as employment productivity and total factor productivity.[15] Respondents were asked to provide financial data for two periods. More specifically, financial information for the two pre-COVID financial periods, which would ensure that the productivity measures were not influenced by the COVID induced shutdown of the South African economy. This section was placed at the end of the survey because respondents are generally reticent to provide financial data, and by placing this section are the end, respondents are more likely to complete the preceding sections – as opposed to seeing the request for financial information and refusing to complete any sections of the survey.

[14] Skills gaps refer to the presence of employees within an establishment that lacked the requisite proficiency for a job, while skills shortages refer to the presence of occupation-level vacancies within and across occupations.

[15] Employment productivity is measured as turnover divided by employment. This is the most simplistic measure of productivity. Total factor productivity is a more complex measure, and one requires data on sales, raw material costs, indirect costs (e.g. electricity, water, telephone, fuel), capital (book or market value) and direct labour costs. Further, in order to follow key approaches to generating this measure, one needs prior data on investment for the Olley-Pakes method, and prior data on raw material costs for the Levinsohn-Petrin method. As such, the questionnaire asked for two periods of financial information.

2.5. Preparation of the survey instrument

The preparation of the survey instrument was an iterative process. This process involved the generation of drafts, meetings among the DPRU research team and the survey company team, critique and input, and then amendment of draft instrument. This process repeated itself multiple times. Once an advanced version of the instrument was generated it underwent a process of conversion into an e-questionnaire – i.e. an electronic online version of the questionnaire. This process again involved scripting and design, multiple iterations of validation and testing, feedback meetings, and further refinement by the DPRU research team and the survey company team.

2.6. Ethics approval

After the survey instrument is designed, protocols at the University of Cape Town require that the proposed fieldwork and associated survey instrument undergo a process of ethical clearance before fieldwork can commence. The application for ethics clearance requires the DPRU to present the survey instrument, the data management and storage plans, and protocols to ensure anonymity of respondents. The DPRU team put together a package, which was deemed consistent with UCT best practice, and ethics approval was granted by the Commerce Ethics in Research Committee.

3. Sampling methodology

One of the key outputs of this survey process is the production of a representative dataset for analysis of the MER sector. To ensure the production of such a representative dataset, it is key to ensure that the sample of firms presented with the survey instrument is carefully and systematically constructed in order to ensure representativity of the population as a whole. We detail our processes for constructing an appropriate sample below.

3.1. Determining a sampling frame

To draw a representative sample for any research process, it is necessary to have a sampling frame that includes the entire target population one intends to examine, and ideally excludes any elements not in the target population. In the case of this study, the target population can be described as "manufacturing firms within the MER sector", and as a result, it was necessary to obtain a sampling frame that captured the entire universe of manufacturing firms within the MER sector.[16] Since firms have to register their affiliation with merSETA to be considered part of the MER sector, identifying the universe of MER sector firms is possible through administrative records held at the merSETA records office.

However, the MER sector is a diverse group of institutions that comprise manufacturing firms, service firms, combinations of manufacturing and services firms, educational and training institutions, as well as trading firms (those firms that buy and sell already-manufactured products in local or international markets, but do not themselves engage in manufacturing processes). Our focus was restricted to firms engaged in manufacturing activity within the MER sector, and as a result, we would need to limit the population of firms in our sampling frame accordingly.

In order to construct this sampling frame, we were provided with three distinct datasets from the merSETA records offices: firstly, a large register dataset consisting of 87 966 observations, each of which identifies a firm that has, at some point since the inception of merSETA, registered with the

[16] The MER sector is a sectoral construct emerging from the Manufacturing, Engineering and Related Services Sector Education and Training Association (merSETA), and constitutes firms that reside in the automotive, automotive components, automotive services, metals and engineering, plastics and new tyre (rubber) sub-sectors.

merSETA records office; secondly, a dataset consisting of 15 385 firms recorded as paying levies to merSETA in 2021[17]; and finally, a dataset consisting of 4 739 firms recorded as having submitted their workspace skills plans (WSPs) to merSETA in 2021. To note, for the most part the firms in the WSP dataset are a subset of those in the levy-paying dataset. These WSP firms have submitted a plan to merSETA which outlines their intentions to train their staff for the upcoming 12-month period. The incentive for engaging with this process is the potential for a rebate on the levy paid to merSETA.

Firms are identified using their unique Skills Development Levy (SDL) number, which acts as a unique identifier across all three datasets. Using this SDL number, we merged the WSP and levy-paying datasets into the larger register dataset. This merge was necessary since the data required to systematically identify firms for our sample, such as address or contact information, was spread across the three datasets and not simply stored in a single dataset.

After merging the datasets together, we obtained a master dataset with a total of 89 102 observations.[18] To the best of our knowledge, this merged master dataset now contained the universe of all firms that operated in the MER sector, which, for our purposes, needed to be further limited to the universe of manufacturing firms operating within the MER sector.[19]

The cleaning process undertaken to limit the merged dataset was time-consuming and iterative, raising several challenges. First, we note that the MER sector does not consist solely of manufacturing institutions. Since the population of interest to this study is manufacturing firms, it was necessary to remove all entities that could be classified as "non-manufacturing". Institutions that could have entered the register dataset but which were non-manufacturing included educational institutions, non-profit organisations and government departments. The only method available for cleaning such firms out of the merged dataset was through a string-match procedure on institutions' trading names. This entailed searching for certain identifiers such as "NGO", "TVET"[20] or "Department of" and where institutions' names included these strings, as well as other selected phrases, they were dropped. This method is not perfect, however, as certain phrases may be common across manufacturing and non-manufacturing entities, and thus by dropping firms with these phrases in their names, we may be dropping firms that should actually be part of our sampling frame. As a result, we were extremely conservative in dropping line items in the dataset using this string-match method, and opted to err on the side of caution and, where any ambiguity existed about whether firms were manufacturing or not, we opted not to drop them from our sampling frame and rather filter them out through our screening questions that appear at the start of our survey instrument.

Secondly, we noted that the motor chamber is divided into two distinct groups: namely, automotive component manufacturers, and firms that operate as service providers in the motor retail subsector (such as auto-electricians). According to Standard Industrial Classification (SIC) codes, all firms in the manufacturing sector should be classified under major group 3 – i.e., their SIC code begins with the

[17] Firms in the MER sector are liable to pay a skills development levy to merSETA so as to be eligible for the skills development policies and interventions merSETA runs in the MER sector. This dataset includes a list of all firms that were recorded as having paid this skills development levy.

[18] This number is larger than the total observations in the register dataset due to some firms in the levy-paying and WSP datasets not appearing in the register dataset.

[19] It is useful to note at this point that the quality of this master dataset is directly linked to the eventual quality of the sample drawn for analysis. Given that the register dataset was missing observations that appeared in the WSP and levy-paying datasets, it is possible that the master merged dataset did not include the universe of MER sector firms. The extent to which this is the case will impact how appropriate the merged dataset is to act as a universe of MER sector firms. However, with no better options, we must assume this merged dataset is appropriate; we just note that if concerns over data quality exist for any of the three constituent datasets used, these concerns will feed through into the veracity of the final results presented in this report.

[20] TVET stands for "Technical and Vocational Education and Training", thus identifying such firms as educational institutions.

digit "3". Thus, we opted to drop all firms that did not fall under major group 3 from the sampling frame. However, upon further investigation, this method was also not without challenges: after investigating small random samples of firms, we ascertained that certain firms were classified under major group 3 even when they were not actually manufacturing entities. We performed further string matches on the remaining firms to try drop firms whose trading names identified them clearly as non-manufacturing firms – e.g., "auto electrician". Again, we were conservative in our approach and opted to rather filter through use of the screening questionnaire than risk biasing the sample frame inadvertently.

Thirdly, the register dataset did not only include active MER sector firms, but rather was a collection of entities that had belonged to merSETA since its inception, with new information being appended to the dataset over time, and inactive firms not being removed from the dataset. To this end, the register dataset does not represent the universe of *active* merSETA firms – which is what we would be interested in sampling – but rather a collection of all firms that have at some point been members of merSETA, but which may no longer be members of merSETA because they have closed down; merged with other firms; deregistered; or moved to alternative SETAs due to changes in their business scope. One way to identify active firms in the dataset was to consider those firms whose information had successfully merged from the 2021 levy-paying and WSP datasets, as this indicated that they had been actively participating in the MER sector either by paying levies to merSETA or submitting a WSP in the 2021 reporting cycle.

However, a concern existed that firms in the register dataset who did not appear in the levy-paying or WSP datasets may also be active, and excluding these firms would unduly bias the sampling frame due to non-response or data capturing error in these datasets. An indicator variable[21] in the register dataset identified firms as having a status from one of the following: "active", "de-registered", "stopped trading", "unknown" and "estate". A preliminary investigation showed high, but not perfect, correlation between firms that were classified as "active" and firms that had non-zero employment and payroll figures. Further investigation, by means of internet searches, using primarily the Companies and Intellectual Property Commission database, and a short telephonic screening of a random sample of these firms, indicated that firms that appeared in the register dataset but not in either of the other two were either not operational, part of a different SETA, or inactive. As a result, all firms that did not appear in the WSP and levy-paying data were dropped from consideration.

Moreover, some firms that appeared in the levy-paying data did not appear in the WSP data which makes sense as the firms that form the WSP data are those levy-payers that have also submitted a plan for training their workforce in order to claim back a portion of the levy paid to merSETA. This resulted in a final list of 9560 establishments , constituting a combination of observations from the levy-paying and WSP datasets, to be used as the sampling frame representing the population of manufacturing firms in the MER sector. This sampling frame is likely to be close to a true list of manufacturing firms in the MER sector that were active as of 2021 and paid levies.

3.2. Sampling

The description above describes the process of cleaning the administrative data provided by the merSETA records office in such a way as to obtain a sampling frame that most accurately captures the population of active and levy-paying manufacturing firms in the MER sector. From this sampling frame, one can then draw a sample of firms for analysis using the survey instrument designed for this

[21] This variable is captured as dol_status in the merSETA register dataset.

purpose.[22] In order to ensure that the sample is representative of various sub-sectors of the MER sector, we opted to construct a stratified sampling design rather than use a simple random sample.

One key consideration in the sampling design for this research is that our merged data show that the distributions of firm characteristics in South Africa are not always uniform across characteristics: regarding size, there are many more small and medium firms than there are large firms in the economy; regarding geographic location, manufacturing firms are primarily located in three major provincial hubs in South Africa – Gauteng, Western-Cape and Kwa-Zulu Natal. Moreover, the distribution of firms amongst chambers in the MER sector is not uniform, with many firms in the Metal chamber and substantially fewer firms present in the New Tyre chamber, for example. As a result of this uneven split of firms in the population data, a simple random sample would not be sufficient to ensure that reasonable sample sizes from important groupings (e.g., firm size, location and chamber) were selected for participation in the study.

In order to ensure that we obtain firms from each chamber, across the size distribution and with geographic variation, we opted to create a stratified sample for our analysis. In particular, we opt to explicitly stratify, first by chamber, followed by firm size[23], and finally using implicit stratification by province within each explicit stratum to achieve reasonable sample sizes by provincial groupings.[24]

Concerns arise due to the not-insubstantial number of firms with missing data for one or more of our three stratification variables of interest in the merged dataset. Specifically, with location (which is derived from the organisation's regional information in the merged dataset), there are 34.4 percent of firms in unknown provinces. For chamber, this figure is more modest at only 17.3 percent with missing information. We overcame the challenge of missing data in our stratification variables by creating an additional category of "Unknown" within each of chamber and province and treating this "Unknown" group as a separate category for stratification.

A limitation to this approach is that stratification aims to group sampling units according to categories that lead to relatively homogenous groups of firms within each stratum, and heterogeneity across strata. However, the lack of information for those firms categorised as "Unknown" in either province or chamber (or both) means that there is no way of verifying – and in fact there is little reason to suspect – that firms within this stratum are homogenous in any way. When calculating sampling weights to correct for the complex survey design, one assumes that one respondent firm in a given stratum is representative of a number of other firms in the same stratum. Although this may still hold in the case of the clearly defined chambers and locations, it is unlikely to hold for strata that include an "Unknown" category. Although we raise this as a possible concern, we consider the creation of "Unknown" categories to be more desirable than a situation where firms with any missing data are dropped from the sampling frame altogether, since this approach may systematically bias the sample and subsequent results in unobservable ways. Although the assumption of homogeneity of firms in the "Unknown"

[22] Since surveying the full population of MER sector manufacturing firms would be too costly and time consuming, it became necessary to restrict the survey to a representative sample of these firms.

[23] Firm size is proxied for in our data by the amount of levy paid by a firm due to data quality concerns with the "number of employees" variable. This variable is well populated, with very few observations not having a value for levy paid, and it is related to firm size as levy paid is equivalent to 1% of the firm's wage bill. In the case where a levy paid amount is not available, a combination of payroll information and number of employees was used to impute the levy paid and classify firm size.

[24] Implicit stratification is the process of sorting firms into order according to some stratification variable (here, by province) and then systematically selecting firms from this list at consistent intervals until the desired number of firms has been achieved. This means that one achieves variation across the categories of this stratification variable without explicitly creating additional cells from which to sample, which could result in unworkably small or empty strata.

category is tenuous, it does at least provide some information on these firms, even if this means that weighted results from this survey may be slightly more unstable.

Once the categories for stratification had been determined, the sample was drawn. To begin, a Neyman allocation method was used to determine the stratum sample sizes across the primary stratification variable: chamber. This method aims to minimise the uncertainty of population estimates derived from the sample. The levy paid by each firm was used as the characteristic whose variance the Neyman method minimised. Given that we had initially hoped for a sample of 900 firms, the final Neyman allocation of sampling units across our primary stratification variable (chamber) is as follows:

Table 1. Neyman allocation of sample across primary stratification variable (chamber)

Chamber	Observations	Coefficient of Variation	Neyman sample allocation
1. AUTO	121	3.211	40
2. METAL	6275	5.854	516
3. AUTO COMPONENTS	1062	3.083	112
4. NEW TYRE	105	3.796	43
5. PLASTICS	1322	2.454	99
6. UNKNOWN	675	3.119	90
Total			900

Within each primary stratum, further stratification was conducted by firm size, as measured by levy paid. Analysis of the distribution of firm size along with cluster analysis was undertaken by the contracted statistical expert to determine the size cutoffs that would be used to create our secondary strata. The cutoffs used differed by chamber (primary stratum) due to differences in size distribution across the primary strata. The resulting cutoff points to be used in each chamber are as follows:

Table 2. Cutoff points for secondary stratum (firm size) by chamber

Chamber	Cut 1	Cut 2	Cut 3
1. AUTO	2 000 000	95 635	20 913
2. METAL	1 800 000	89 777	20 050
3. AUTO COMPONENTS	600 000	46 440	12 920
4. NEW TYRE	200 000	24 022	8 326
5. PLASTICS	600 000	46 440	12 920
6. UNKNOWN	180 000	22 551	7 982

Notes: The cutoffs presented in the table are based on the distribution of levies paid. Given that levies are equivalent to 1% of wage bill, the corresponding wage bill cutoffs would be 100 times larger in magnitude.

The three size cutoff points result in four secondary stratification categories, informally thought of as “Very Large”, “Large”, “Medium” and “Small”. This resulted in a total of 24 strata: 6 chamber strata crossed with 4 firm size strata. Within each of these 24 strata, an independent sample was drawn with varying probability of selection. In the “Very Large” strata, firms were selected with certainty – i.e., all “Very Large” firms were included in the sample – while the probability of selection decreased as the firm size stratum represented smaller and smaller firms. In the strata where firms were selected with probability below 1, firms were sorted by province and then sub-sorted by levy paid and a systematic sample was drawn from each stratum. This resulted in a final distribution of the sample and is presented in Table 3. In this table the top number in each cell is the number of firms sampled from that stratum, while the number in parentheses is the total number of firms in that stratum in the population.

Table 3. Stratified sample design for MER sector survey study

	Size category 1 "Very Large"	Size category 2 "Large"	Size category 3 "Medium"	Size category 4 "Small"	Total
1. AUTO	12	4	17	7	40
	(12)	(20)	(34)	(55)	(121)
2. METAL	46	197	188	85	516
	(46)	(987)	(2063)	(3179)	(6275)
3. MOTOR	30	44	8	30	112
	(30)	(219)	(333)	(480)	(1062)
4. NEW TYRE	10	8	9	16	43
	(10)	(21)	(39)	(35)	(105)
5. PLASTICS	18	29	20	32	99
	(18)	(324)	(460)	(520)	(1322)
6. UNKNOWN	7	9	10	64	90
	(7)	(71)	(147)	(450)	(675)
TOTAL	123	291	252	234	900
	(123)	(1642)	(3076)	(4719)	(9560)

Note: Top number in each cell represents number of firms identified as part of our sample. Numbers in parentheses indicate total number of firms in each stratum. Selection probability in each stratum can be calculated as the top number divided by the bottom number in each cell.

After drawing the desired sample from each stratum, all remaining firms were numbered to be used as substitutes if a sampled firm opted not to respond to the questionnaire, or if a sampled firm revealed themselves to be a non-manufacturing firm through the screening questionnaire. To this end, we aimed to mitigate any representativity issues introduced by our conservative approach to cleaning non-manufacturing firms out of the merged master dataset, while also trying to ensure that we could attain a reasonable number of responses.

4. Implementation of the Survey

In this section we describe the process undertaken to implement the MER Sector Enterprise survey. We start by outlining key interventions that were implemented prior to going into field. We then detail the fieldwork process, including the method of implementation undertaken in both the pilot and main studies. We conclude by discussing some of the key challenges that arose during the fieldwork phase of the survey.

4.1. Pre-fieldwork Preparation

There are two key elements to the preparatory phase before going into field: first, the development of a training manual for the enumerators, and second, the implementation of various marketing interventions to promote the survey among the MER sector target group. We discuss these below.

4.1.1.MER Sector Enterprise Survey Training Manual

Prior to going to field, a team of enumerators from the survey company underwent comprehensive training for the study. A training manual, developed by the DPRU in conjunction with survey company, formed the basis of this training.

The training manual is a detailed 51-page report used to train the enumerators. The manual starts by describing the industrial composition of the Manufacturing, Engineering and Related Services Sector Education and Training Association (merSETA) and its core function of identifying the skills needs of the MER sector, and then how it facilitates the skills development and training required to meet these needs.

The manual then follows the structure of the survey instrument and starts each section by describing the purpose of the section and the type of data the section is designed to capture. Within each section, the manual systematically works through each question and details the following: First, the purpose and thinking behind the question. Second, if the question, based on response, skips the respondent to different question pathways, then the manual explains how the skip logic behind this flow of these questions and how it should be implemented. This is also useful when scripting of the survey instrument to an e-questionnaire. Third, where applicable, the manual provides relevant information on the question specific answer options available to the respondent. The manual also provides definitional descriptions of key terms that assist the enumerator when listing the options to the respondent and understanding the respondent's answers. Where applicable, these definitions are included in the e-questionnaire. Fourth, where applicable, the manual explains the exact nature of information that one aims to obtain from the respondent. Fifth, in the case where drop-down lists are required for a question, the manual details what should be included in these lists.

4.1.2. Marketing of the Survey

To assist in driving up response rates, the research team undertook several marketing interventions, both before and during the survey.

The research team attended (virtually) two sets of merSETA chamber meetings to promote the survey.[25] In the third quarter of 2020, the DPRU team presented the research findings from the report authored by Allen Whitehead & Bhorat (2021). This report analyses the economic complexity of the MER sector and identifies industrial diversification opportunities – frontier products – that would feasibly build economic complexity in the sector and drive economic growth. The MER Sector Enterprise survey extends this research by Allen Whitehead & Bhorat (2021) by investigating the constraints facing MER sector firms, either currently manufacturing frontier products, or those looking to diversify into these products. In these chamber meetings the DPRU advertised the survey to chamber representatives. The purpose and motivation for the survey was explained and representatives were assured of the anonymity of the firms that they represent in the respective chambers. In the third quarter of 2021, the DPRU team again reminded the chamber representatives of the upcoming survey and requested that they encourage their members to participate in the survey.

merSETA provided additional support to market the survey. The survey was marketed on the merSETA website with a banner, alerting members to the survey. Member firms could glean additional information about the survey by clicking on the banner. The DPRU developed a document linked to the banner, which provided information on the purpose of the survey, reasons to participate, and how the ideas of economic complexity and industrial relatedness inform industrial diversification for the sector. merSETA also sent out letters of introduction to chamber representatives again informing them of the survey and encouraging participation. Further, merSETA reached-out to employer organisations linked to the MER sector to encourage participation.

4.1.3. Protection of Personal Information Act

The Protection of Personal Information Act (POPIA) came into effect in August 2021, and this impacted on the processes going into the survey and into its eventual implementation (see Section 4.3 below). As a result of the POPI Act, prior to commencement of the main survey, merSETA sent out a notice informing firms of the survey. In this communication firms were given an opportunity to opt out within a given period. Firms that opted out were removed from the sample frame, and the sample, should

[25] MerSETA comprises six industry specific chambers – the auto chamber, the auto component chamber, the plastics chamber, the new tyre chamber, the metals chamber and the motor retail chamber – and the DPRU team presented to each of these chambers.

they be in the sample, however, this only affected one firm from the sample and nine firms from the substitutes list. This ensured compliance with the POPI Act.

4.2. Fieldwork

In this section we detail how the survey company implemented the fieldwork phase of the survey. We describe the method of implementation that was applied across the pilot and main surveys, then we outline the data quality management interventions implemented by the survey company and the DPRU, and then we discuss how the recording of non-response was implemented and thus informed adjustments to the weights (as discussed in Section 3).

4.2.1. Method of implementation

The method applied to conducting the interviews is outlined in the following steps:

- Survey company sent out a letter of introduction, endorsed by merSETA and the University of Cape Town, to firms in the sample prior to telephonic contact.[26] In instances where sampled firms do not have contact information within the sample frame dataset, the survey company conducted online research to source the relevant contact information.
- Initial e-mail contact was followed up by the calling of the firm to establish the primary contact person. The research team identified the Human Resources Manager as the ideal individual to facilitate the completion of the survey within the establishment.[27]
- An appointment was scheduled with this individual to conduct the screening questionnaire and thus establish whether the establishment qualified for the survey.[28] [29]
- If the firm qualified, then the enumerator would continue the interview and shift to sections A through to F and establish the relevant people that would need to be contacted within the establishment.[30] The implementation of the interview was conducted via a web-based questionnaire that was administered and completed through a telephonic interview conducted by the enumerator. The online questionnaire contains all the validations and routing, and thus ensuring that the data collected was structured in the appropriate form.
- A number of respondent establishments that agreed to participate in the survey, but after completing the screening section of the questionnaire did not qualify to participate. These establishments were typically not engaged in manufacturing activity – i.e. non-manufacturing establishments. In such instances, these firms were substituted. Importantly, information on

[26] The letter of introduction, compiled by the DPRU, detailed the broader aims of the research project, the motivation behind the survey, the importance of gathering high quality data, the potential outcomes of the research, and assurance of anonymity. The letter was signed by the merSETA representative thus assuring the respondent of its authenticity.

[27] Given that the survey had multiple sections that required several individuals across the establishment to provide information, the survey company advised that a survey 'champion' be identified to facilitate the completion of the survey within the establishment. The HR Manager was identified as the ideal candidate as s/he is most likely to be aware of merSETA and thus deal with SETA related matters.

[28] To ensure compliance with UCT ethics best practice and the POPI Act, the enumerator needed to notify the respondent of informed consent, which would state that should the respondent not be comfortable with answering any of the questions they can refuse, and should they want to stop answering the survey at any point, they can.

[29] Where requested by the respondent, the survey company emailed the respondent a copy of the questionnaire so that the establishment could see beforehand the types of information required, thereby enabling the establishment to prepare the information. The electronic questionnaire cannot provide respondents with a view of the full questionnaire as it is programmed to proceed from one question to another only once the relevant information has been filled in. The copy of the questionnaire is simply for the establishment to be able to see what type of information is required, so that the document can be circulated among internal stakeholders.

[30] The electronic questionnaire for each respondent establishment had a unique identifier and unique link. This ensured that the enumerator would fill in data consistent with the respondent being interviewed. Further, should the respondent want to self-complete the questionnaire, the unique link could be moved across individual respondents within the establishment.

these establishments were retained so as to inform non-response adjustments to the survey weights.

- For sampled firms, which are either non-responsive, fail the screening questionnaire, or refuse to participate, where substitute firms are available, the survey company followed the order of firm contacts as per the sample. The order of substitution is important for the sample reweighting process. All relevant information was recorded.[31]

This process was implemented across both the pilot and main surveys.

4.2.2. Pilot study

A pilot study of 30 firms was undertaken to test the survey instrument and the survey structure, and to identify potential challenges, problems and possible deficiencies in the survey instrument and protocols prior to implementation of the main study. The pilot survey also tested the recruitment and consent rates of firms. The pilot study commenced the week of the 16th of August 2021 and ended the week of the 27th of October 2021 – a period of approximately 7 weeks. A team of five enumerators, experienced in conducting business surveys and executive interviews undertook the pilot interviews and they were supported by two administrators who assisted with contacting the sampled firms and the setting up the interviews.

A number of challenges and learnings emerged from the pilot study. Where a successful contact with the establishment was made, the initial contact person is the receptionist. The receptionist is asked for the contact information of a senior person in the establishment who is able to provide the required information. Identifying the right respondent is challenging because most senior people were working remotely at this stage, and gatekeepers such as receptionists and frontline staff, are generally hesitant or refuse to divulge details, such as the names, email addresses and personal contact numbers of senior executives. There were instances where enumerators were directed to senior managers who stated that they are not the right person to speak to, and in turn, either terminating the interview at that stage or referring the enumerator to Human Resources. Subsequent to contacting HR, the enumerator would then be bounced from one person to another – this is exacerbated by many of the managers working remotely during this COVID period. Where enumerators were able to access the correct respondent, many stated that they were too busy and at that stage either refused outright, or stated that they will look at the questionnaire at a more convenient time. What was evident is that the senior executives spent a lot of time in meetings and their mobile phones are on voicemail. Even when they are in the office, generally on a rotational basis, they are difficult to access because they were very busy. Completing the interview is not a priority to them. Some respondents made appointments then either cancelled and/or rescheduled for a later date. The survey company would continue to follow up with these respondents. Most respondents requested a link to the self-completion questionnaire. A number of respondents refused to be interviewed after they saw the questionnaire. They considered the information required in Section B (Production) and Section C (Employment and Skills), in particular, to be highly confidential and either refused to share the information or said they would need to get authorisation from the most senior persons in the organization, which was unlikely as these business leaders are also likely to be very busy. A few respondents started completing the interview, but then delayed completing the full interview as they did not have access to all the information required for the survey. The interview length took, on average, between 20 and 25 minutes to complete, but this is subject to the delays when multiple respondents are involved.

[31] The survey company management system kept a detailed record of all contacts and attempts, with full details on dates, times, person contacted and the outcome.

For the most part the survey instrument was answered well. The only major adjustment to the survey instrument was a restructuring of Section F, which aims to capture financial information. Respondents did not want to provide detailed financial data – only 3 of the 15 successful responses in the pilot phase provided financial data. In an attempt to obtain at least some basic financial data, Section F was restructured to ask for some basic financial information, such as Sales, Costs of sales and whether the establishment made a gross profit in the financial period of interest. If these data were provided, then the remaining questions in Section F asked for more detailed financial data. Apart from this adjustment to Section F, a few minor alterations to promptings in the instrument were made.

At the end of the pilot phase, 13 successful interviews were conducted out of the 76 attempts to contact firms in the MER sector (17%) (see Table 4). It is worth noting that even after adjusting the sample frame to remove non-manufacturing firms, 23 (30%) respondents completed the screening questionnaire and stated that they did not engage in manufacturing activity. Put differently, these respondents were prepared to complete the survey, but did not qualify, which suggests that nearly 50 percent of the attempts were in fact successful. There were 11 (15%) outright refusals, 3 firms with no contact details and 1 firm that had closed down. A further 17 respondents were in progress with completing the survey.

Table 4: Summary of Pilot Study Responses

Successful	13
Questionnaire in progress	17
Attempting to make contact	8
No contact details	3
Non-Manufacturing	23
Closed down	1
Refusals	11
Total Attempts	76

4.2.3.Main study

After taking into account feedback and observations from the pilot study, adjustments were made to the web-based questionnaire in order to facilitate self-completion of the questionnaire by multiple respondents within an organisation. Data collection on the main survey commenced on 17 November 2021. Due to many establishments slowing down operations during the December holiday period, interviews ran until 22 December 2021, and recommenced on 12 January 2022, running until the end of April 2022. The survey team was expanded to a team of 26 interviewers who had been trained on the questionnaire and survey protocols. The team of interviewers were supported by three administrators and managed by three supervisors and an operations manager. An updated letter of introduction, endorsed by the merSETA and DPRU, was sent to companies prior to establishing the initial telephonic contact.

At completion of the main survey, a total of 253 establishments – or 18 percent of the sample – answered the survey (see Table 5). What is important to note is that 481 establishments from the sample completed the screening questionnaire, and were thus prepared to answer the survey, but did not qualify as manufacturing establishments. This was despite our best efforts to restrict the sample frame to manufacturing establishments. However, the non-response rate for the survey was high, with 708 establishments not completing the survey. Nevertheless, as discussed below, the response rate of approximately 35 percent, was not out of step with other such surveys conducted during the COVID-19 period.

Table 5: Summary of Response at Completion of Fieldwork

Successful	254
Non-manufacturing firm	481
Questionnaire in progress	322
Attempting to make contact	74
Awaiting response to email	125
Closed down	13
Refusal	154
Cannot find contact information	20
Total	1443

4.2.4. Data quality management

Both the survey company and the research team undertook various data quality management measures. The survey company conducted data quality management interventions in parallel with fieldwork. Quality controllers reviewed audio files and scripts from each telephonic interview. Statisticians at the survey company cleaned accumulated data. Data review workshops were held to refine training and questionnaire validations where necessary. Regular progress reports were submitted to the DPRU research team, and if necessary, meetings were conducted to address any issues that arose during fieldwork.

The DPRU research team undertook several quality control interventions in addition to those conducted by the survey company. Progress reports from the survey company were monitored and discussed. In instances where a major challenge arose, the survey company team and the DPRU research team would meet and strategize a solution.[32] At more advanced stages of the survey, once a sufficient number of completed surveys had been accumulated, the research team conducted sense checks of these data.[33] This process of monitoring and sense checking continued throughout the fieldwork phase.

4.2.5. Capturing non-response

Data was also collected on non-response and the reason for non-response, as this would provide important information when adjusting the design weights for non-response post-survey. In Table 5 we see several non-response categories reported by the survey company. These include items where the survey company was attempting to establish whether the firm wanted to participate or not, such as *attempting to make contact*, or *awaiting response to e-mail*. Included in this category would be firms with the status, *questionnaire in progress*. In the majority of these cases, firms had simply opened the link to the self-completion questionnaire, read the letter of introduction, moved to the landing page, and failed to proceed any further (perhaps a tacit refusal). In very few instances had these respondents actually started to answer the questionnaire. Non-response items also included *firm closed down*, *cannot find contact information* and *refusal*.

The most important category of non-response, certainly from a weight calculation perspective, is the scenario where an establishment was declared a non-manufacturing establishment through the screener questionnaire. As evident in Table 5, the number of non-manufacturing establishments (481)

[32] For example, initial reports pointed to very low response rates. As a result it was decided that further marketing of the survey was necessary. This included lobbying my merSETA to stakeholders in the sector.

[33] For example, the data would be checked for certain patterns that were consistent with stylized facts in the relevant field of study. For example, larger firms are more likely to be exporters (Bernard, Jensen Redding & Schott, 2007).

is almost double the number of successful survey completions for manufacturing establishments (253). It is also important to emphasise that these are establishments that, for all intents and purposes, were prepared to proceed with the survey as they had already committed to answering the screening questionnaire. It is also worth noting that substantial efforts were made to remove non-manufacturing establishments from the sample frame – as discussed in Section 3. In Section 5, we discuss how this information on the quantum of non-manufacturing establishments is used to adjust the assumed population of manufacturing establishments in the MER sector and hence the calculation of the survey weights used in the analysis.

4.3. Challenges

This section details some of the challenges that arose during the survey. These included, running a survey during the COVID-19 period, a general sense of survey fatigue among respondent firms, the enactment of the POPI Act, the practical challenges associated with capturing diverse sets of information across an organisation, and the period of implementation.

4.3.1. COVID-19

South Africa, and the world in general, faced an unprecedented situation in the COVID-19 global pandemic. From a practical standpoint, the initial impact of the pandemic induced lockdowns was a delay in the survey and related activities. Thereafter, various other challenges associated with varying lockdown levels and the impacts on work affected the implementation of the survey.

It is worth noting that the survey company had to alter its approach to conducting surveys. The survey company shifted to a decentralized call centre in response to the lockdown. All enumerators were given tables and worked remotely. Further, during this phase, the survey company had to customize its systems to monitor enumerators and manage information.

The pandemic resulted in many of the workforce shifting to remote work setups. While this was less likely to impact the production employees at manufacturing plants, what did emerge was that non-production employees tended to work remotely from home. The survey company noted that most senior people were working remotely, and gatekeepers such as receptionists and frontline staff, are generally hesitant, or refuse, to divulge details such as the names, email addresses and personal contact numbers of senior executives. As such, it was challenging to reach the relevant people in the firm.

4.3.2. Survey fatigue

Perhaps relatedly, it has been noted that respondent firms have been subject to survey fatigue. During the COVID period, over and above surveys that are implemented periodically, such as the Quarterly Employment Survey by Statistics South Africa, a large number of other surveys designed to assess the socio-economic impacts of the pandemic were implemented. For example, some respondents alerted the survey company of having already completed a survey for merSETA, and on that basis refusing to participate in any further surveys.

4.3.3. Protection Of Personal Information (POPI) Act and anonymity

A further complication that emerged during the survey implementation period was the enactment of the POPI Act. This took place between the pilot study and the main study. As alluded to above, to ensure compliance, merSETA had to send out a communication to all stakeholders notifying them of the survey and offering them an opportunity to opt out of the survey. The legal process behind designing and implementing this plan delayed the transition of the study from the pilot phase to the main phase.

It is worth noting that in general, obtaining information from firms is challenging, especially when requesting certain sensitive information. Financial information (Section F), in particular is challenging

to obtain, and many respondents refused to provide these data. Curiously, some respondents felt that the information requested in Section B on the types of products that establishments manufacture and information in Section C on the skills and qualifications of the workforce was too sensitive to provide. Providing such information would require authorisation from senior management and in many cases this did not materialise.

4.3.4.Structure of survey and information required

Another challenge emerged from the types of information that the survey instrument was designed to obtain. Given the diversity of this information, the questionnaire and, and/or the enumerator, had to be shifted across individuals within the organisation. This proved challenging, but no different from other surveys of a similar type.

4.3.5.Period of implementation

The final challenge worth mentioning is the period of implementation of the survey. The survey ended up running over the Christmas period, which is typically a difficult period to conduct surveys. As such, the survey company delayed fieldwork over the period 23 December 2021 through 12 January 2022. Thereafter, the challenge became financial year end, with many firms having their financial year end 28 February. Over this period, respondents are less likely to volunteer time to participate in a survey. As such, the survey was extended for an additional month.

5. Post-survey adjustments

5.1. Weight adjustments

As noted above, a relatively high fraction of firms did not respond to the survey and, in addition, many non-manufacturing firms were sampled, indicating that, despite the best efforts of the research team, the sample frame contained many non-manufacturing firms. On their own, each of these two issues are not difficult to address. Non-response is usually dealt with by adjusting the design weights. The presence of sampled firms not in the target population can be dealt with by simply excluding them and not adjusting for non-response. But the presence of both issues together required further work, as we now describe.

A total of 1317 MER sector firms were contacted as part of the survey. Of this number, 254 were successfully interviewed, 481 completed the screening questionnaire but were found to be non-manufacturing and 582 firms did not respond to the survey. This information is summarised in Table 6. The question is then how one should treat the 582 firms for which no information was obtained. Given the large number of non-manufacturing firms amongst the firms that did respond, it would not make sense to assume the 582 non-responding firms were all manufacturing firms, and then adjust the design weights for non-response. A second option would be to use the ratio of 254:481 in estimating the proportion of the 582 firms that were manufacturing, but this introduces a substantial amount of uncertainty.

To make progress the DPRU team undertook extra desktop research on the 582 non-responding firms. 449 were found to be manufacturing, a much higher ratio than 254:481. 82 of the 582 non-responding firms were not manufacturing firms and 51 could be classified as either manufacturing or non-manufacturing. This extra work enabled the calculation of a much more accurate overall response rate, which was between 33.7 and 36.1 percent. The lower and upper bounds correspond to assuming the 51 unclassified firms were all manufacturing firms, or none were manufacturing firms. If this additional post-survey desktop research had not been conducted, the bounds on the response rate would have been 30 percent and 100 percent (100% would correspond to none of the 582 non-responding firms being manufacturing firms).

Taking the extra information obtained about the non-responding firms into account, the response rate in each stratum was then calculated as the number of responding manufacturing firms in the stratum divided by the total number of manufacturing firms in the stratum. The design weight for each stratum was then multiplied by the inverse of the response rate to obtain a non-response adjusted weight that was used in the analysis. Some of the secondary strata (firm size strata) had no responding firms in them and were combined to calculate the non-response adjusted weights. Using the information about the non-manufacturing firms obtained for the sample, we estimate that there are approximately 5000 manufacturing firms in the MER sector.

Table 6. Survey interview outcome summary

Status		Number of firms	% of total contacted firms
Successfully interviewed		**735**	**55.8**
	Manufacturing	254	19.3
	Non-manufacturing	481	36.5
Non-response (i.e., interview incomplete)		**582**	**44.2**
	Manufacturing	449	34.1
	Non-manufacturing	82	6.2
	Unknown	51	3.9
Total contacted firms		**1 317**	**100.0**

Note however, that a key assumption underlying the adjustment of design weights for non-response is that the characteristics of non-responding firms in each stratum are comparable to those of the responding firms in the same stratum. The relatively low response rate of between 33.7 and 36.1 percent, indicates that if this assumption is wrong it could introduce substantial biases in our estimates. Nevertheless, we decided to make use of the non-response adjusted weights in our analysis, since it is likely to be better than making no adjustment at all. We should also note that a response rate of approximately 35 percent is comparable to response rates of other large surveys run during the COVID period. For example, wave 1 of the NIDS-CRAM survey[34] had a 40 percent response rate (Kerr, Ardington and Burger, 2020) and was widely used to inform government policy during the progression of the COVID-19 pandemic in South Africa during 2020 and 2021.

However, even though we opt to make use of the non-response adjusted weights in our analysis, there are certain caveats to be aware of. The first is that use of these weights requires the assumption that the characteristics of respondents and non-respondents are comparable. Second, the non-response adjustment of the design weights increases the uncertainty of the estimates obtained from the sample relative to a situation of no non-response. Coupled with the small sample size of responding firms, we do not feel comfortable using the data gathered to report on absolute figures or levels in the population of MER sector firms. Instead, we opt to report in shares or percentages wherever possible.

5.2. Mapping of products to trade data

Throughout the survey, responses regarding products that establishments are currently producing or those products that they aim to diversify into, captures responses according to establishment-supplied definitions. Allowing responses to be freeform on the establishment's part has the added advantage of being able to capture high levels of detail regarding the products that establishments are or plan on

[34] National Income Dynamics Study: Coronavirus Rapid Mobile Survey. For more information, visit https://cramsurvey.org/.

producing. However, on the other hand, these freeform responses are not immediately mapped to any standard product taxonomy.

As a result, we undertook a mapping of establishment responses to the 4-digit Harmonised System (HS) codes – an international product classification that is commonly used in trade data and, most importantly for us, in the body of research related to economic complexity. By mapping establishment descriptions of products to the relevant HS code used in the international trade data, we are then able to link firm responses to questions to research done on economic complexity both within the MER sector (e.g., Allen Whitehead and Bhorat (2021)) and other research more broadly.

This mapping of products was purely desktop work, which entailed extracting a list of establishment responses to all questions where a product name or description was mentioned. Thereafter, this list of products was researched and cross-referenced to the HS code database, with each product being allocated the appropriate 4-digit HS code. Where it was difficult to determine exactly what a product was, desktop research of the firm and/or the remaining products in the production portfolio ensued, which allowed us to ultimately find and classify all products listed by respondent establishments.

After mapping establishments' responses to their appropriate HS codes, these codes were double-checked by another team member before being merged back into the dataset for analysis. We retain the original establishment description of the product in the database alongside the allocated HS code so that other researchers can interrogate this mapping themselves.

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Appendix A: Survey Instrument

MMERSETA Firm-level Survey Version for self-completion V7 - 20211019			
merSETA MANUFACTURING, ENGINEERING AND RELATED SERVICES SETA	DPRU DEVELOPMENT POLICY RESEARCH UNIT	Citizen Surveys	**Citizen Surveys** 1st Floor De Waal House 172 Victoria Road Woodstock, Cape Town, 7925 Tel: 021 4474484 Fax 021 4486312 Email:contact@citizensurveys.info

Dear Stakeholders

REQUEST TO PARTICIPATE IN THE MER SECTOR ENTERPRISE SURVEY

The Development Policy Research Unit (DPRU), a think-tank housed within the University of Cape Town's School of Economics, has been employed by the merSETA to investigate the economic complexity of the MER sector. The theory of economic complexity, which provides the conceptual basis for our research is most well-known by research from the Centre of International Development at Harvard University and MIT.

A growing manufacturing sector is critical for the South African economy to achieve sustained and inclusive economic growth. At its core, the research aims to identify growth opportunities that have the potential to build economic complexity, drive growth within the MER sector, and thereby contribute to the re-industrialisation of the South African economy. Most importantly, the research seeks to determine the constraints that inhibit diversification into, and expansion of, growth opportunities. By interrogating the constraints plaguing the MER sector's future growth path, merSETA can facilitate skills development interventions and lobby the relevant policy forums toward interventions and industrial policy formulation to enable the realisation of identified growth opportunities.

We understand concerns regarding the confidentiality and privacy of the firm-level data we require in order to achieve the research objectives. And we take these concerns very seriously.

First, we have employed Citizen Surveys to implement the survey. Citizen Surveys is a member of the South African Market Research Association and adheres to its ethical standards, and the strict data protection and storage standards laid out in the POPI Act (2013). Second, the DPRU received ethics approval for this survey from the UCT's Ethics Committee (Reference REC: 2021/05/010). Ethics approval required a data management plan that ensures all firm-level information will be anonymised, remain confidential, kept secure, and used solely for analytical purposes.

The value and intended benefits of the research rely on your firm's participation. We humbly request 20 minutes of your time to complete this online survey. Your input will be valued and highly appreciated. In turn, we will share a report of the research findings with your organisation.

If you have any question or concerns regarding this survey, you may contact either Professor Haroon Bhorat at DPRU (haroon.bhoratharoon.bhorat@uct.ac.za), Boitumelo Makgoba at merSETA (bmakgoba@merseta.org.za) or Washeelah Kapery at Citizen Surveys (washeelah@citizensurveys.info).

Home Page

Section S	**Screening**	Section S determines whether the study is relevant to your establishment.	**Please click here to go to section S**
Section A	**Basic information on structure of establishment**	Section A covers the structure of the business and is best completed by a senior executive in finance or production.	**Please click here to go to section A**
Section B	**Manufacturing and Production**	Section B covers the portfolio of products manufactured in this establishment and is best completed by a senior executive in production.	**Please click here to go to section B**
Section C	**Employment and Skills**	Section C covers the importance of different skills in meeting the demands of the jobs in an establishment and is best completed by a senior executive in HR or production.	**Please click here to go to section C**
Section D	**Constraints to existing product portfolio**	Section D covers the constraints to growth in the production and sale of the current product portfolio. It is best completed by a senior executive in production.	**Please click here to go to section D**
Section E	**Diversification opportunities and constraints**	Section E aims to identify growth and expansion opportunities, and the constraints that inhibit diversification and expansion of growth opportunities. It is best completed by a senior executive in production or finance.	**Please click here to go to section E**
Section F:	**Basic Financial information to build a model of total factor productivity**	The Development Policy Research Unit (University of Cape Town's School of Economics) requires basic financial information for TWO pre-COVID financial periods (excluding 2020 Covid period). The purpose of this is to generate a measure productivity, which allows one to analyse the relative productivity of the MER sector and its constituent chambers. In no way is an individual firm's information identifiable in the associated analysis. This section is best completed by a senior executive in finance or management.	**Please click here to go to section F**

SCREENING SECTION

This section determines whether the survey is relevant to your establishment.

Establishment name	Scripter: Autofill
SDL Number	Scripter: Autofill
Province	Scripter: Autofill
Name of person completing this section	
Position	
Contact number	Leave blank and do not put in any numeric – alpha validations
Email Address	Leave blank and do not put in any numeric – alpha validations

S1	**Is this establishment part of a multi-establishment firm?** *(that is, a firm with several establishments, each with its own location, management, activity and financial statements).*

Yes	1	Go to S2
No	2	Go to S5

S2	**Is this establishment the headquarters (or head office) of the firm?**

Yes	1	Go to S3
No	2	Go to S4

S3	**Are the financial statements of the headquarters location separate from those of the other establishments?**

Yes	1	Go to S5
No	2	Go to S5

S4	**Are this establishment's financial statements prepared separately from the head quarter's financial statements?**

Yes	1	Go to S5
No	2	Go to S5

S5	**Does this establishment participate in manufacturing activities (by this we mean manufacturing activity at your current location)?**

Yes	1	Go to S6
No	2	Scripter see instruction below

Scripter note: if S5 =2 (NO) and S1 =1 (YES) - skip to S11
if S5 =2 (NO) and S1 =2 (NO) - **skip to S10**

S6	**Does this establishment belong to the Manufacturing, Engineering and Related Services Sector Education and Training Authority (or merSETA)?**

Yes	1	Skip to S8
No	2	Go to S7
Don't know	99	Skip to S9

S7	**Which SETA (Sector Education and Training Authority) does your firm belong to?**

SCRIPTER: Insert DROPDOWN LIST			
FASSET	Financial and Accounting Services SETA	1	Skip to S14
BANKSETA	Banking Sector Education & Training Authority	2	Skip to S14
CHIETA	Chemical Industries Education & Training Authority	3	Skip to S14
FP &M SETA	Fibre Processing & Manufacturing Sector Education and Training Authority	4	Skip to S14
CETA	Construction Education & Training Authority	5	Skip to S14
EWSETA	Energy and Water Sector Education Training Authority	6	Skip to S14
FOODBEV	Food & Beverages Manufacturing Industry	7	Skip to S14
HWSETA	Health & Welfare Sector Education and Training Authority	8	Skip to S14
MICTSETA	Media Information and Communication Technologies	9	Skip to S14
INSETA	Insurance Sector Education & Training Authority	10	Skip to S14
LGSETA	Local Government, Education and Training Authority	11	Skip to S14
SASSETA	Safety and Security Education and Training Authority	12	Skip to S14
AgriSETA	Agriculture Sector Education and Training Authority	13	Skip to S14
PSETA	Public Service Sector Education and Training Authority	14	Skip to S14
SERVICES SETA	Services Sector Education and Training Authority	15	Skip to S14
CATHSSETA	Culture, Arts, Tourism, Hospitality and Sports Education and Training Authority	16	Skip to S14
TETA	Transport Education and Training Authority	17	Skip to S14
W &RSETA	Wholesale and Retail Sector Education and Training Authority	18	Skip to S14
Other ;	Specify		Skip to S14
	Don't know	99	Skip to S14

S8	**Which chamber, within the MerSETA (Manufacturing, Engineering and Related Services Sector Education and Training Authority) does your firm fall into?**

Auto manufacturing chamber	1	Scripter: This is a qualifying manufacturing establishment in the merSETA. Go to S13 and then to S15
Automotive component manufacturing chamber (formerly part of Motor chamber)	2	Scripter: This is a qualifying manufacturing establishment in the merSETA. Go to S13 and then to S15
Metal and engineering chamber	3	Scripter: This is a qualifying manufacturing establishment in the merSETA. Go to S13 and then to S15
New Tyre manufacturing chamber (rubber products)	4	Scripter: This is a qualifying manufacturing establishment in the merSETA. Go to S13 and then to S15
Plastics manufacturing chamber	5	Scripter: This is a qualifying manufacturing establishment in the merSETA. Go to S13 and then to S15
Motor retail and aftermarket chamber	6	Skip to S14
Don't know	99	Ask S9

	[SCRIPTER: SINGLE RESPONSE]
S9	**Which of the following industry descriptions best describes the PRIMARY MANUFACTURING ACTIVITIES of your firm?**

Manufacture of Auto Components		
Manufacture of	bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	1
	parts and accessories for motor vehicles and their engines	2
	transport equipment (not elsewhere classified)	3
Manufacture or Assembly of Auto-mobile		
Manufacture of	motor vehicles	4
Manufacture of Metal and/or Machinery Products		
Manufacture of	basic iron and steel	5
	basic precious and non-ferrous metals	6
	structural metal products, tanks, reservoirs and steam generators	7
	other fabricated metal products; metalwork service activities	8
	general purpose machinery	9
	special purpose machinery	10
	household appliances (not elsewhere classified)	11
	electric motors, generators and transformers	12
	electricity distribution and control apparatus	13
	insulated wire and cable	14
	electric lamps and lighting equipment	15
	electronic valves and tubes and other electronic components	16
	other electrical equipment (not elsewhere classified)	17
	television and radio transmitters and apparatus for line telephony and line telegraphy	18
	television and radio receivers, sound or video recording or reproducing apparatus and associated goods	19
	medical appliances and instruments and appliances for measuring, checking, testing, navigating and for other purposes, except optical instruments	20
	optical instruments and photographic equipment	21
	railway and tramway locomotives and rolling stock	22
	aircraft and spacecraft	23
	building and repairing of ships and boats	24
	casting of metals	25
Manufacture of Rubber Products		
Manufacture of	rubber products	26
Manufacture of Plastic Products		
Manufacture of	basic chemicals	27
	plastic products	28
	Recycling NEC	29

Other	30	SCRIPTER – SKIP TO S14
Don't know	99	SCRIPTER – SKIP TO S14

	SCRIPTER ASK ONLY if S1 =2 (NO) AND S5 =2 (NO)
S10	**Could you please describe what industry your establishment operates in?**

Insert industry description		SKIP TO S14

S11	SCRIPTER: ASK ONLY if S1 =1 (YES) AND S5 =2 (NO) **Given that your establishment belongs to a multi-establishment firm, do other establishments in your firm partake in manufacturing activity?**

Yes	1	ASK S12
No	2	SKIP TO S14

S12	**Could you please provide some information on each of the firms in this establishment that partake in manufacturing activity specific to MerSETA?**

S12_1	Scripter remove all validations we had on this section
a. What is the name of the establishment	
b. What is the main manufacturing activity at this establishment?	
c. What is the approximate number of employees?	
d. In which province is this establishment located?	
Name of Contact person	
Position of contact person	
Contact numbers	
Email address	

SCRIPTER: add instruction	**Are there any other firms in this establishment that partake in manufacturing activity specific to MerSETA?**

Yes	1	Scripter repeat table for S12_2
No	2	Scripter route to S14

SCRIPTER: add instruction	**Are there any other firms in this establishment that partake in manufacturing activity specific to MerSETA?**

Yes	1	Scripter repeat table for S12_3
No	2	Scripter route to S14

Scripter note: This table is not shown to interviewer or the respondent				
scripter: Outcome of screening section: [FOR OFFICE USE: VALIDATE AND ASSIGN THE CODE]				
S13	DESCRIPTION	VALUE	VALIDATION	
	Manufacturing establishment in merSETA	1	S5 = 1 & S6 = 1 & S8 = 1/2/3/4/5 or S5 = 1 & S6 = 99 & 0<S9<30 or S5=1 & S6 = 1 & S8 = 99 & 0<S9<30	Scripter: Go to S15
	Manufacturing establishment in a different SETA	2	S5 = 1 & S6 = 2 and S7 = 'string response' or (some other options emerging from a 'don't know' or 'other' response in S9)	Go to S14 and close Interview
	Non-manufacturing single-establishment firm	3	S1=2 & S5=2 & S10 = 'string response'	Go to S14 and close Interview
	Non-manufacturing establishment belonging to multi-establishment firm with other manufacturing establishments	4	S1=1 & S2=2 & S5=2 & S11=1 & S12a='string response	Go to S14 and close Interview
	Non-manufacturing establishment – **head office** – belonging to multi-establishment firm with other manufacturing establishments	5	S1=1 & S2=1 & S5=2 & S11=1 & S12a='string response'	Go to S14 and close Interview
	Non-manufacturing establishment belonging to multi-establishment firm **not involved in manufacturing**	6	S1=1 & S2=1/2 & S5=2 & S11=2	Go to S14 and close Interview
	Refuse to participate	7	close interview	Go to S14 and close Interview

S14	On behalf of MerSETA and the DPRU of the University of Cape Town, we would like to thank you for your time and valuable input. [CLOSE INTERVIEW]

S15 Thank you for completing this section. Your establishment qualifies for this study. Please click here to return to the Home Page, which will take you to the sections that have to be completed by your establishment.

Go to Home Page	

SECTION A: BASIC INFORMATION OF ESTABLISHMENT

This section covers the basic structure of the business and is best completed by a senior executive in finance or production.

Establishment name	Scripter: Autofill
SDL Number	Scripter: Autofill
Province	Scripter: Autofill
Name of person completing this section	
Position	
Contact number	Leave blank and do not put in any numeric – alpha validations
Email Address	Leave blank and do not put in any numeric – alpha validations

A2	**What is the current legal status/structure of the firm? By this we mean the whole firm, including all of its establishments.**

Sole Proprietorship	1
Partnership	2
Close Corporation (CC)	3
Personal Liability Company (Inc)	4
Private Company (Pty Ltd)	5
Public Company (Ltd)	6
State-Owned Company (SOC)	7
External Company/Branch i.e., foreign company with a branch in South Africa	8
Other (please write in)	9
Don't know	99
Refuse	98

Scripter:	*Answer only if S1 = 1 and S2 = 2. i.e. multi-establishment firm where establishment is not headquarters or head office).*
A3	**Where is the Head Quarters of the firm located?**

In South Africa	1	Go to A3a
Outside South Africa	2	Go to A3b
Don't know	99	Skip to A4
Refuse	98	Skip to A4

A3a HQ Location in SA	
In which **province** is the headquarters of this firm located?	Province (insert drop down list)

A3b HQ Country location	
In which **country** is the headquarters of this firm located?	Country (scripter: insert drop down list. Enumerator must be able to type in a few letters to narrow down the list rather than just the first letter)
Scripter:	Answer only if S1 = 1 (i.e. a multi-establishment firm)

A4	**Does the firm have manufacturing establishments and/or sales or service establishments (e.g. dealership) that are located in other countries?**

Manufacturing establishments only	1	Go to A5
Sales or service establishments only	2	Go to A5
Both	3	Go to A5
Neither	4	Go to A5

Ask A5 onward to all respondents.

A5	**In which month does this firm's financial year end?**

Month (insert drop down list)	
Don't know	99
Refuse	98

A6	**What is the most recent financial period for which you have prepared financial statements?**

2020/2021	1
2019/2020	2
2018/2019	3
2017/2018	4
2016/2017	5
Other: specify	6
Don't know	99
Refuse	98

NB. THE FOLLOWING QUESTIONS PERTAIN TO THIS ESTABLISHMENT ONLY

A7	**In which year did this establishment begin operations?** *(If part of a multi-establishment firm emphasise that we are referring only to this establishment.)*

Year	
Don't know	99
Refuse	98

We thank you for your valuable time and feedback. Once the study is completed, the MerSETA will provide you with a report of the research findings.

End of section A	Go to Home Page

SECTION B: MANUFACTURING AND PRODUCTION

This section covers the products manufactured in this establishment and is best completed by a senior executive in production.

Establishment name	Scripter: Autofill
SDL Number	Scripter: Autofill
Province	Scripter: Autofill
Name of person completing this section	
Position	
Contact number	Leave blank and do not put in any numeric – alpha validations
Email Address	Leave blank and do not put in any numeric – alpha validations

Now we would like to some questions about the **current portfolio of products manufactured** at this establishment. By current portfolio of products, we mean products that have been consistently manufactured at this establishment over the past two to three years.

scripter	In B1b a product cannot be 0% share of sales – must be >1%

B1		
A. Please list the five most important products currently manufactured at this establishment i.e. those that account for the largest share of total sales. • *Please list the products manufactured at this establishment* • ***Do not list activities** – only list products manufactured* • *Do not list products purchased for resale.* • *Do not list varieties of a given product – only distinct products.* • *Please provide a detailed description of each product.*	**B. What is this product's approximate share of total sales** *(scripter: provide code option for don't know 99)*	C. HS Product Code (FOR OFFICE USE)
	% of total sales	
Product 1		
Product 2		
Product 3		
Product 4		
Product 5		

	Scripter: Auto fill all products from B1A
B2	**Ask for each product:** Was ……..exported?

Product & Description	**Indicate if Product was Exported**			
Scripter: Autofill from B1a	**Yes**	**No**	**Refused**	**Don't know**
	1	2	98	99
	1	2	98	99
	1	2	98	99
	1	2	98	99
	1	2	98	99

	Scripter: Autofill products exported in B2 (Yes= 1 in B2).
B3	**How many destination countries does your establishment export to?**

Autofill products from B2=1	**Approximate number of destinations** *If uncertain indicate approximate number of destinations)*	**Refused**	**Don't know**
		98	99
		98	99
		98	99
		98	99
		98	99

B4	**Does this establishment have any internationally recognised certifications?**

Yes	1	Ask B5 and B6
No	2	Skip to the end of this section
Don't know	99	
Refuse	98	

	SCRIPTER: Multiple response
B5	**What are these internationally recognised certifications? Please select as many options as are relevant, and/or list others not specified below.**

SANS 9001 or SABS ISO 9001 (Quality Management System certified))	1
IATF 16949 (International Automotive Task Force Automotive Quality Management System certified)	2
VDA 6.1 (Quality Management Standard for automotive industry)	3
VDA 6.4 (Quality Management Standard for Production Equipment in automotive industry)	4
Certificate of Conformity (CoC)	5
ISO 14001 (Environmental Management System certified)	6
ISO 50001 (Energy Management System certified)	7
OHSAS 18001 or ISO 45001 (Occupational Health and Safety Management System certified)	8
Other, specify	9
Don't know	99
Refuse	98

B6	**Are these internationally recognized certifications required for this establishment to directly access export markets and/or indirectly access export markets via global value chains (for example, being able to supply a downstream manufacturer involved in the manufacture of a final product that is later exported)?**

Yes	1

No	2
Don't know	99
Refuse	98

We thank you for your valuable time and feedback. Once the study is completed, the MerSETA will provide you with a report of the research findings.

End of section B	Go to Home Page

SECTION C: EMPLOYMENT AND SKILLS

This section covers the importance of different skills in meeting the demands of the jobs in an establishment and is best completed by a senior executive or HR.

Establishment name	Scripter: Autofill
SDL Number	Scripter: Autofill
Province	Scripter: Autofill
Name of person completing this section	
Position	
Contact number	Leave blank and do not put in any numeric – alpha validations
Email Address	Leave blank and do not put in any numeric – alpha validations

Now I would like to ask you about the number of employees employed by this establishment for 2018 and 2019. **We are not discussing 2020, the Covid-19 period.**

By employed, I mean full-time permanent employees, full-time contract employees and part-time employees on your payroll, as well as any owners, but excluding outside contractors.

C1-1a	In total, how many employees, including yourself, were employed at this establishment at the end of **2018?** Scripter add instruction here: **If your firm did not exist in 2018 please put in a ZERO**

C1-1A. Total Number of employees in 2018	

Scripter: if C1 A = ZERO then C2-1A and C3-1A must not be asked.

Please ensure that C1b, C2b and C3b have to be answered.

C1-1b	In total, how many employees, including yourself, were employed at this establishment at the end of **2019?**

C1-1B. Total Number of employees in 2019	

Now we would like to know how many of these employees were full-time permanent workers, full-time contract workers and part-time workers?

*By **full-time permanent workers** we are referring to workers that work for a term of one or more fiscal years and/or have a guaranteed renewal of their employment and that work a full shift.*

*By **full-time contract workers** we are referring to those who are employed for the short-term that is for less than a year, with no guarantee of renewal of employment and work a full shift.*

C2-1a	**In 2018, what proportion or share of your total number of employees were full-time permanent workers, full-time contract workers and part-time workers?** *Please ensure that the proportions add up to 100%. If you are unsure please give your best estimate.*

C2-1a **2018 SHARE OF EMPLOYEES** Proportion/share of full-time permanent employees, full-time contract employees and part-time employees *Please ensure that the proportions add up to 100%*		**Don't know**	**Refused**
	%		
a. Full-time permanent employees		99	98
b. Full-time contract employees		99	98
c. Part-time employees		99	98
Scripter: C2 a,b & c must add to 100%	**100%**		

C2-1B	**In 2019, what proportion or share of your total number of employees were full-time permanent workers, full-time contract workers and part-time workers?** *Please ensure that the proportions add up to 100%. If you are unsure please give your best estimate.*

C2-1b **2019 SHARE OF EMPLOYEES** Proportion/share of full-time permanent employees, full-time contract employees and part-time employees *Please ensure that the proportions add up to 100%*		**Don't know**	**Refused**
	%		
d. Full-time permanent employees		99	98
e. Full-time contract employees		99	98
f. Part-time employees		99	98
Scripter: C2 d+e+f must add to 100%	**100%**		

C3-1a	Of the total number of employees, what proportion or share of your employees were **production workers** and what proportion were **non-production workers** for **2018?** By production workers, we mean employees directly involved in the manufacture of products manufactured at your establishment. By non-production workers, we mean employees involved in non-production activities, such as administration and sales.

C3-1a 2018 Share of production workers and non-production workers *Please ensure that the proportions add up to 100%*	
a. % Production employees	
b. % Non-production employees	

C3-1b	Of the total number of employees, what proportion or share of your employees were **production workers** and what proportion were **non-production workers** for **2019?** By production workers, we mean employees directly involved in the manufacture of products manufactured at your establishment. By non-production workers, we mean employees involved in non-production activities, such as administration and sales.

C3-1b 2019 Share of production workers and non-production workers *Please ensure that the proportions add up to 100%*	
c. % Production employees	
d. % Non-production employees	

C4	**Now we would like to ask about your current workforce (i.e. in 2021).** **Approximately, how many employees in your current workforce work in the following occupation groupings?** *If there are no employees for a particular occupation group then insert a zero.*

Occupation Groupings in current workforce	**Approximate Number of employees**
a. Managers (OFO1) (e.g. *Chief Executives, Managing Directors, Administration, Sales, Marketing, ICT, Production, Manufacturing and Development Managers)*	
b. Professionals (OFO2) *(e.g. Engineering Professionals, Electro technology Engineers, Finance, Administration, Sales, Marketing, and Legal Professionals)*	
c. Technicians and associate professionals (OFO3) *(e.g. Engineering Science Technicians, Manufacturing Supervisors, Process Control Technicians, Financial Associate Professionals, Sales and Purchasing Agents, ICTS Technicians)*	
d. Clerical Support Workers (OFO4) *(e.g. General Office Clerks, Secretaries, Tellers, Money Collectors and Related Clerks, Numerical Clerks, Client Information Workers, Other Clerical Support Workers)*	
e. Service and sales workers (OFO5) *(e.g. Sales and service)*	
f. Craft and related trades workers (OFO6) *(e.g. Sheet and Structural Metal Workers, Moulder/Welders, Blacksmiths, Toolmakers/related Trades Workers, Machinery Mechanics/Repairers, Electrical Equipment Installers/Repairers, Handicraft Workers)*	
g. Plant and machine operators and assemblers (OFO7) *(e.g. Metal Processing/Finishing Plant Operators, Rubber/Plastic Products Machine Operators, Chemical Product Plant and Machine Operators, Assemblers, Car, Van and Motorcycle and Heavy Truck Drivers, Mobile Plant Operators)*	
h. Elementary occupations (OFO8) *(e.g. Office Cleaners and Helpers, Manufacturing Labourers, Transport Labourers)*	

Scripter: The total number of employees for categories A to H must be greater than zero.

	Scripter: autofill occupation groupings of workforce from C4 >THAN ZERO One answer per occupation grouping
C5	**What is the typical level of qualification that is currently held by individuals working in ……..** *(Answer for each occupation grouping listed)*?

Occupation Group	No formal education	Incomplete secondary education	Complete secondary education	Diploma, post-secondary certificate or technical certificate	Bachelor's degree or higher diploma	Post-graduate degree	Don't know
	1	2	3	4	5	6	99
	1	2	3	4	5	6	99
	1	2	3	4	5	6	99
	1	2	3	4	5	6	99
	1	2	3	4	5	6	99
	1	2	3	4	5	6	99
	1	2	3	4	5	6	99
	1	2	3	4	5	6	99

	Scripter: autofill occupation groupings from C5
C6	**What is the typical level of qualification that is required of new hires to enter the occupation of ……..** *(Answer for each occupation grouping listed)?*

Occupation Group	No formal education	Incomplete secondary education	Complete secondary education	Diploma, post-secondary certificate, or technical certificate	Bachelor's degree or higher diploma	Post-graduate degree	Don't know	Refused
	1	2	3	4	5	6	99	98
	1	2	3	4	5	6	99	98
	1	2	3	4	5	6	99	98
	1	2	3	4	5	6	99	98
	1	2	3	4	5	6	99	98
	1	2	3	4	5	6	99	98
	1	2	3	4	5	6	99	98
	1	2	3	4	5	6	99	98

C7	Scripter: autofill occupation group from C5 **Now we would like to talk about the importance of different skills in meeting the demands of the jobs within each of the occupation groups in your workforce.** **For each skill below I would like you to rate the importance of this skill in meeting the demands of the jobs within each of your occupation group.** *Please use a scale of 1 to 4 where 1 is Not important at all, 2 is a low level of importance, 3 is moderately important and 4 is essential. If a specific skill is not relevant, mark under 'not relevant' column.*

Autofill Occupation Group							
Skill	**Not important at all**	**Low level of importance**	**Moderately important**	**Essential**	**Not relevant**	**Don't know**	**Refused**
a. Literacy (*Reading and writing)*	1	2	3	4	0	99	98
b. Numeracy (*Being able to do basic mathematical calculations - add, subtract, divide etc.)*	1	2	3	4	0	99	98
c. Physical (*Use of stamina in a job)*	1	2	3	4	0	99	98
d. Communication (*Instructing, negotiation, client communication, team work etc.)*	1	2	3	4	0	99	98
e. Planning *(Personal time management and planning ahead for a project)*	1	2	3	4	0	99	98
***f.* Problem solving** *(Detecting, diagnosing, analysing, and resolving problems)*	1	2	3	4	0	99	98
g. Technical know-how *(Knowing how to use/maintain tools, equipment, monitor operations, and knowledge of the product)*	1	2	3	4	0	99	98
h. Emotional management (*Managing one's own feelings and those of others)*	1	2	3	4	0	99	98
i. Digital (*Use a computer, create a spreadsheet, search and collect information online, software design, adapt to new technology)*	1	2	3	4	0	99	98

C8	Scripter: autofill occupation groupings listed in C5 **For each of the following occupation groupings in your establishment, please indicate what percentage of your current workforce are not fully proficient?** *A proficient employee is someone who is able to do the job to the required level.*

Occupation Grouping Scripter: autofill occupation groupings listed in C5	**Percentage not fully proficient (%)**	**Refused**	**Don't know**
		98	99
		98	99
		98	99
		98	99
		98	99
		98	99
		98	99
		98	99

C9	**Does this establishment currently have <u>any vacancies</u>?**

Yes	1	GO TO C10
No	2	GO TO C15
Don't know (spontaneous)	99	
Refuse (spontaneous)	98	

C10	**Approximately how many vacancies are there currently at your establishment??**

Insert number	
Don't know	99
Refuse	98

Scripter: value must be = to or > than 1 - should not be able to respond zero vacancies when the respondent has indicated that there are vacancies in C9.

C11	**Are any of these vacancies <u>hard-to-fill?</u>**

Yes	1	Go to C12
No	2	Skip to C15
Don't know	99	Go to C12
Refuse	98	Go to C12

C12a	**Are there any hard-to-fill vacancies in the following occupation groups?** *Answer for each occupation grouping, even if it does not exist in the current workforce.*

scripter	If YES in C11 at least one of the occupation groups below in C12a must have a code 1=YES

Occupation Group	Yes	No	Don't know	Refuse
a. Managers (OFO1) (e.g. *Chief Executives, Managing Directors, Administration, Sales, Marketing, ICT, Production, Manufacturing and Development Managers)*	1	2	99	98
b. Professionals (OFO2) *(e.g. Engineering Professionals, Electro technology Engineers, Finance, Administration, Sales, Marketing, and Legal Professionals)*	1	2	99	98
c. Technicians and associate professionals (OFO3) *(e.g. Engineering Science Technicians, Manufacturing Supervisors, Process Control Technicians, Financial Associate Professionals, Sales and Purchasing Agents, ICTS Technicians)*	1	2	99	98
d. Clerical Support Workers (OFO4) *(e.g. General Office Clerks, Secretaries, Tellers, Money Collectors and Related Clerks, Numerical Clerks, Client Information Workers, Other Clerical Support Workers)*	1	2	99	98
e. Service and sales workers (OFO5) *(e.g. Sales and service)*	1	2	99	98
f. Craft and related trades workers (OFO6) *(e.g. Sheet and Structural Metal Workers, Moulder/Welders, Blacksmiths, Toolmakers/related Trades Workers, Machinery Mechanics/Repairers, Electrical Equipment Installers/Repairers, Handicraft Workers)*	1	2	99	98
g. Plant and machine operators and assemblers (OFO7) *(e.g. Metal Processing/Finishing Plant Operators, Rubber/Plastic Products Machine Operators, Chemical Product Plant and Machine Operators, Assemblers, Car, Van and Motorcycle and Heavy Truck Drivers, Mobile Plant Operators)*	1	2	99	98
h. Elementary occupations (OFO8) *(e.g. Office Cleaners and Helpers, Manufacturing Labourers, Transport Labourers)*	1	2	99	98

	Scripter: autofill occupation groupings with hard to fill vacancies (YES=1 in C12a)
C12b	**Approximately how many of the …..(autofill from C10 hard-to-fill vacancies are there in the following occupation groups?**

Occupation Group	Number of hard to fill vacancies

	Scripter: ask if YES in C11 or YES to any Occupation Group in C12 A
C13	**In which specific occupations are these hard to fill vacancies?** *By specific occupations, we're referring to specific job titles in your establishment, such as Master Toolmaker, Metal Machinist, Plastic Technologist, Welder, Welding Technologist, Welding Inspector, Automotive Machinist, and the like.* **Please list the top five hard-to-fill occupations**

	Insert the Name of the hard to fill **specific occupations**
1.	
2.	
3.	
4.	
5.	

	Scripter: C14 a will be repeated for each occupation group (yes=1 in C12a)

	Scripter: autofill occupation group (yes=1 in C12a) [SCRIPTER – MULTIPLE RESPONSES allowed per grouping]
C14a	**Now we would like to establish the reasons for hard-to-fill vacancies amongst the occupation groups that you mentioned. Now, what are the reasons for vacancies being hard to fill amongst ……. (***Answer for each occupation grouping listed***)?** *Please select as many reasons as are applicable.*

Autofill occupation group (yes=1 in c12a)	
a. Too much competition from other employers	1
b. Not enough people interested in doing this type of job	2
c. Poor terms and conditions (e.g. pay) offered for post	3
d. Low number of applicants with the required technical skills	4
e. Low number of applicants with the required digital skills	5
f. Low number of applicants with the required attitude, motivation or personality	6
g. Low number of applicants, generally	7
h. Lack of work experience	8
i. Lack of qualifications	9
j. Job entails shift work/unsociable hours	10
k. Remote location	11
l. Other: please specify	12
m. **Other: please specify**	13
n. **Other: please specify**	14
o. Don't know	99

[NOTE: C14 is repeated for each occupational group (Yes=1 in C12a)

[NOTE: there are three versions to C15 – however respondent will answer only one version – either a,b or c

Scripter:	Ask C15A If sum of C8>0, and C11=1 (YES)
C15a	**To what extent do you think that parts of your existing workforce <u>not being fully proficient at their jobs and the existence of hard-to-fill vacancies</u> have negatively impacted this establishment's performance?** *Please use a scale of 1 to 4 where 1= no negative impact, 2 = minor negative impact, 3 = moderate negative impact and 4 = major negative impact.*

No negative impact	Minor negative impact	Moderate negative impact	Major negative impact	Don't know	Refused
1	2	3	4	99	98

Scripter:	Ask C15B if the sum of C8>0, and C9=2 (NO) or C11 (NO)
C15b	**To what extent do you think that parts of your existing workforce <u>not being fully proficient at their jobs</u> have negatively impacted on the establishment's performance?** *Please use a scale of 1 to 4 where 1= no negative impact, 2 = minor negative impact, 3 = moderate negative impact and 4 = major negative impact.*

No negative impact	Minor negative impact	Moderate negative impact	Major negative impact	Don't know	Refused
1	2	3	4	99	98

Scripter:	Ask C15C If the sum of C8=0, and C11=1 (YES)
C15c	**To what extent do you think that the <u>existence of hard-to-fill vacancies</u> have negatively impacted on this establishment's performance?** *Please use a scale of 1 to 4 where 1= no negative impact, 2 = minor negative impact, 3 = moderate negative impact and 4 = major negative impact.*

No negative impact	Minor negative impact	Moderate negative impact	Major negative impact	Don't know	Refused
1	2	3	4	99	98

We thank you for your valuable time and feedback. Once the study is completed, the MerSETA will provide you with a report of the research findings.

End of section C	Go to Home Page

SECTION D: CONSTRAINTS TO EXISTING PRODUCT PORTFOLIO

This section covers the portfolio of products manufactured in this establishment and is best completed by a senior executive in production.

Establishment name	Scripter: Autofill
SDL Number	Scripter: Autofill
Province	Scripter: Autofill
Name of person completing this section	
Position	
Contact number	Leave blank and do not put in any numeric – alpha validations
Email Address	Leave blank and do not put in any numeric – alpha validations

Kindly note that the questions in this section pertains to your establishment's current production portfolio.

D1	**To what degree are the following factors a constraint to growth in the production and sale of your establishment's current product portfolio?** *For each factor, please use a scale of 1 to 5 where 1= no obstacle at all, 2= a minor obstacle, 3 =a moderate obstacle, 4 =a major obstacle and 5 =a severe obstacle to indicate the degree of its constraint to growth.*

Constraint	No obstacle	Minor obstacle	Moderate obstacle	Major obstacle	Severe obstacle	Don't know	Not Applicable
a. **Infrastructure constraints** (e.g. *Water; electricity; water; transport; telecommunication; access to land)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
b. **Business regulatory constraints** (e.g. *Administrative costs associated with licensing and permits; costs of preparing documents; environmental regulations; tax regulations and administration; BBBEE)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
c. **Product standardisation and certification** (e.g. *Costs of product standardisation, certification, and quality assurance; Capacity constraints at standards, certification and quality assurance authorities, such as the SABS)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
d. **Labour regulatory constraints** (e.g. *Labour regulations such as Labour Relations Act, Basic Conditions of Employment Act, Employment Equity Act, Skills Act; Union disputes)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
e. **Skills and education of available workforce**	*1*	*2*	*3*	*4*	*5*	*99*	*100*

	(e.g. *Technical skills; Digital skills; literacy; numeracy; communication; planning; problem solving; physical skills)*							
f.	**Export regulations, procedures and costs** (e.g. *Exporting regulations and procedures; financial costs of exporting; ports costs; delays at customs; constraints to accessing markets due to non-tariff barriers; tariff barriers)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
g.	**Import regulations, procedures and costs** (e.g. *Import regulations and procedures; customs clearance; tariffs)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
h.	**Production constraints** *(e.g. Difficulties in local procurement of intermediate inputs and raw materials; Insufficient production capacity due to lack of facilities)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
i.	**Domestic and foreign competition** *(e.g. Market competition from domestic and/or foreign firms)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
j.	**Financial constraints** *(e.g. Access to and cost of finance)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
k.	**Macroeconomic constraints** *(e.g. Exchange rate level and volatility; domestic demand; foreign market demand; inflation; low growth environment)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
l.	**Crime** *(e.g. Theft; robbery; vandalism; arson; cyber-crime)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
m.	**Policy uncertainty, government inefficiencies and corruption** *(e.g. Difficulty doing business with government; government corruption; expectation of bribes; policy creating adverse investment environment)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*

Scripter: Ask only if D1A = 4 or 5 (i.e. ***infrastructure constraints*** is a *major or severe obstacle)* *(Multiple Response allowed)*		
D2A	**You stated that infrastructure constraints are an obstacle to the production and sale of this establishment's product portfolio.** Which of the following specific issues are of concern? Please select as many as are applicable, and if there are other relevant issues, please list these.	
	Provision and quality of transport and logistics infrastructure	1
	Cost of transport and logistics infrastructure	2
	Provision and quality of electricity supply	3
	Cost of electricity supply	4
	Provision and quality of water supply	5
	Cost of water supply	6
	Provision and quality of telecommunication and ICT infrastructure	7
	Cost of telecommunication and ICT infrastructure	8

	Access to land	9
	Other, specify (please enter text in the text box)	10
	Other, specify	11
	Other, specify	12

Scripter: Ask only if D1B = 4 or 5 (**business regulatory constraints is a** *major or severe obstacle)* *[Multiple Response]*		
D2B	**You stated that business regulatory constraints are an obstacle to the production and sale of this establishment's product portfolio. Which of the following specific issues are of concern?** *Please select as many as are applicable, and if there are other relevant issues, please list these.*	
	Administrative costs (e.g. time and money spent preparing documents applying for business licenses and permits)	1
	Environmental regulations	2
	Tax regulations and administration	3
	Tax rates	4
	Broad Based Black Economic Empowerment requirements	5
	Other, specify	6
	Other, specify	7
	Other, specify	8

Scripter: ask only if D1C =4 or 5 (**product standardisation and certification constraints** are *major or severe obstacles [Multiple Response]*		
D2C	You stated that **product standardisation and certification constraints** are an obstacle to the production and sale of this establishment's product portfolio. Which of the following specific issues are of concern? *Please select as many as are applicable, and if there are other relevant issues, please list these.*	
	Regulations on product standardisation, certification, and quality assurance (SABS)	1
	Capacity constraints at standards, certification and quality assurance authorities (SABS)	2
	Other, specify	3
	Other, specify	4
	Other, specify	5

Scripter: ask only if D1D = 4 or 5 (**labour regulatory constraints** are a *major or severe obstacle* *[Multiple Response]*		
D2D	You stated that **labour regulatory constraints** are an obstacle to the production and sale of this establishment's product portfolio. Which of the following specific issues are of concern? *Please select as many as are applicable, and if there are other relevant issues, please list these.*	
	Labour regulations such as Labour Relations Act, Basic Conditions of Employment Act, Employment Equity Act, Skills Act etc.	1
	Union disputes	2
	Other, specify	3
	Other, specify	4
	Other, specify	5

Scripter: ask only if D1E = 4 or 5 (**Skills and education of available workforce**) are *major or severe obstacles* *[Multiple Response]*		
D2E	You stated that **skills and education of available workforce constraints** are an obstacle to the production and sale of this establishment's product portfolio. Which of the following specific issues are of concern? *Please select as many as are applicable, and if there are other relevant issues, please list these.*	
	Employees do not have the required qualifications	1
	Employees do not have the required attitude, motivation or personality	2
	Employees do not have the required technical skills	3
	Employees do not have the required digital skills	4
	Other, specify	7

	Other, specify	8
	Other, specify	9

Scripter: ask only if D1F = 4 or 5 (**export regulations, procedures and cost constraints** are *major or severe obstacles [Multiple Response]*		
D2F	You stated that **export regulations, procedures and cost constraints** are an obstacle to the production and sale of this establishment's product portfolio. Which of the following specific issues are of concern? *Please select as many as are applicable, and if there are other relevant issues, please list these.*	
	Export regulations and procedures	1
	Financial costs of exporting (e.g. Lack of export finance; Port costs; Non-payment)	2
	Time costs of exporting (e.g. delays in clearing customs)	3
	Costs and difficulties in finding buyers in overseas markets	4
	Regulatory constraints to accessing markets	5
	Difficulty and costs of integrating into global value chains	6
	Other, specify	7
	Other, specify	8
	Other, specify	9

Scripter: ask only if D1G= 4 or 5 (**import regulations, procedures and cost constraints** are *major or severe obstacles [Multiple Response]*		
D2G	You stated **that import regulations, procedures and cost constraints** are an obstacle to the production and sale of this establishment's product portfolio. Which of the following specific issues are of concern? *Please select as many as are applicable, and if there are other relevant issues, please list these.*	
	Import regulations and procedures (e.g. complicated customs clearance procedures)	1
	Time costs of importing (e.g. delays at customs)	2
	Monetary costs to importing inputs (e.g. high customs duties and non-tariff barriers)	3
	Monetary costs to importing machinery and equipment (e.g. high customs duties and non-tariff barriers)	4
	Other, specify	5
	Other, specify	6
	Other, specify	7

Scripter: ask only if D1H = 4 or 5 (**Production constraints** are *major or severe obstacles*		
D2H	You stated that **production constraints** are an obstacle to the production and sale of this establishment's product portfolio. Which of the following specific issues are of concern? *Please select as many as are applicable, and if there are other relevant issues, please list these.*	
	Difficulty in local procurement of parts and raw materials	1
	Insufficient production capacity due to lack of facilities	2
	Other, specify	3
	Other, specify	4
	Other, specify	5

Scripter: ask only if D1I = 4 or 5 (**domestic and foreign competition** are *major or severe obstacles [Multiple Response]*		
D2I	You stated that **domestic and foreign competition** are an obstacle to the production and sale of this establishment's product portfolio. Which of the following specific issues are of concern? *Please select as many as are applicable, and if there are other relevant issues, please list these.*	
	Domestic competition	1
	International competition, China	2
	International competition, other	3
	Other, specify	4
	Other, specify	5
	Other, specify	6

Scripter: ask only if D1J = 4 or 5 (**financial constraints** are *major or severe obstacles* *[Multiple Response]*		
D2J	You stated that **financial constraints** are an obstacle to the production and sale of this establishment's product portfolio. Which of the following specific issues are of concern? *Please select as many as are applicable, and if there are other relevant issues, please list these.*	
	Access to finance	1
	Cost of finance	2
	Complex application procedures	3
	Collateral requirements too high	4
	Other, specify	5
	Other, specify	6
	Other, specify	7

Scripter: ask only if D1K = 4 or 5(**macroeconomic constraints** are *major or severe obstacles* *[Multiple Response]]*		
D2K	You stated that **macroeconomic constraints** are an obstacle to the production and sale of this establishment's product portfolio. Which of the following specific issues are of concern? *Please select as many as are applicable, and if there are other relevant issues, please list these.*	
	Low rates of economic growth in South Africa	1
	Inflation	2
	Insufficient foreign demand	3
	Insufficient domestic demand	4
	Exchange rate level	5
	Exchange rate volatility	6
	Other, specify	7
	Other, specify	8
	Other, specify	9

Scripter: ask only if D1L = 4 or 5 (**crime is a** *major or severe obstacle)Multiple response)*		
D2L	You stated that **crime** is an obstacle to the production and sale of this establishment's product portfolio. Which of the following specific issues are of concern? *Please select as many as are applicable, and if there are other relevant issues, please list these.*	
	Crime (theft, robbery, vandalism, arson)	1
	Cyber crime	2
	Other, specify	3
	Other, specify	4
	Other, specify	5

Scripter: ask only if D1M = 4 or 5 (**policy uncertainty, government inefficiencies and corruption** are *major or severe obstacle)Multiple response)*		
D2M	You stated that **policy uncertainty, government inefficiencies and corruption** are an obstacle to the production and sale of this establishment's product portfolio. Which of the following specific issues are of concern? *Please select as many as are applicable, and if there are other relevant issues, please list these.*	
	Political instability	1
	Policy uncertainty	2
	Corruption in government	3
	Expectation of bribes	4
	Private sector corruption	5
	Inefficiencies in local government	6
	Inefficiencies in provincial government	7
	Inefficiencies in national government	8
	Other, specify	9
	Other, specify	10

	Other, specify	11

Scripter: Ask if ANY responses in D1 (A to M) are rated between 2 and 5 (minor to severe obstacles)	
D3a	Which, if any, **policy measures** do you think the government could put in place **to overcome the constraints** the establishment faces in the production and sale of its current product portfolio? *Please select as many options as are relevant.*

Offering support measures to increase access to finance for capital investments	1
Introducing subsidies or tax rebates to decrease variable production costs e.g., wage subsidies	2
Reducing the administrative and financial burden faced when applying for licenses and permits	3
Offering exclusive production rights	4
Reducing some of the restrictions imposed by labour regulations	5
Upgrading infrastructure to provide reliable utility supply e.g., electricity and water	6
Trade facilitation initiatives (e.g. reducing number of documents required to export, simplifying customs regulations and procedures)	7
Providing access to worker training programmes	8
Improving access to manufacturing expertise from sources such as academia, research, industry, and government	9
Introduce initiatives to incentivise research and development	10
Other: specify in detail	11
Other: specify in detail	
Other: specify in detail	
Don't know	99
Refuse	98

We thank you for your valuable time and feedback. Once the study is completed, the MerSETA will provide you with a report of the research findings.

End of section B	Go to Home Page

SECTION E: DIVERSIFICATION OPPORTUNITIES AND CONSTRAINTS

This section covers opportunities for diversifying into new products for this establishment and identifying constraints to diversification. It is best completed by a senior executive in production or finance.

Establishment name	Scripter: Autofill
SDL Number	Scripter: Autofill
Province	Scripter: Autofill
Name of person completing this section	
Position	
Contact number	Leave blank and do not put in any numeric – alpha validations
Email Address	Leave blank and do not put in any numeric – alpha validations

E1	Do you see opportunities for diversifying into **new products** for this establishment in the next 5 years? *Please note we are referring to new products and not activities.*

Yes	1	GO TO E2
No	2	GOT TO E9
Don't know	99	
Refuse	98	

E2	Which **three products** offer the greatest potential for your establishment to diversify into in the next 5 years?

Could you give us a detailed description of each product? Please do not list activities – only list products.		HS Product Code (for office use - instruction to coding department)	Refuse
1			98
2			98
3			98

	Scripter autofill Product 1 with detailed description from E2
E3a	**What productive capabilities and know how does the establishment currently possess that would enable it to diversify into …..?** *Please select as many options as are relevant.*

Product 1	
Existing machinery and production processes that could be used or repurposed to manufacture the new product	1
Sufficient factory space to manufacture the new product	2
Excess production capacity	3
Access to the raw materials and/or natural resources required to manufacture the new product	4
Employees with the knowledge and knowhow required to innovate and design the new product	5
Employees with the knowledge and knowhow of the production process needed to manufacture the product	6
Investment in Research and Development that enables the innovation of this product	7
Workers with the required skills to manufacture the new product	8
Networks required to market the new product	9
Supply chain relations required to get the new product to market	10
Knowledge of the market for the new product e.g., market demand and competitors	11
Other: specify	
Other: specify	
Other: specify	
Don't know	99
Refused	98

NOTE: E3 is repeated for each product in E2

	Scripter autofill Product 1 with detailed description from E2
E4a	**Could you please rate the importance of each of the following skills for enabling the establishment to diversify in**to ….. …(product 1 with detailed description)? *Please use a scale of 1 to 4 where 1= Not important at all, 2 = a low level of importance, 3 = moderately important and 4 = essential. If a specific skill is not relevant then you can tick under* **Not Relevant** .

Product 1	**Importance of each skill for enabling establishment to diversify into Product 1**						
Skill	**Not important at all**	**Low level of importance**	**Moderately important**	**Essential**	**Not relevant**	**Don't know**	**Refused**
a. **Literacy** - (*Reading and writing)*	1	2	3	4	0	99	98
b. Numeracy (*Being able to do basic mathematical calculations - add, subtract, divide etc.)*	1	2	3	4	0	99	98
c. Physical (*Use of stamina in a job)*	1	2	3	4	0	99	98
d. Communication (*Instructing, negotiation, client communication, team work etc.)*	1	2	3	4	0	99	98
e. Planning *(Personal time management and planning ahead for a project)*	1	2	3	4	0	99	98
f. **Problem solving** *(Detecting, diagnosing, analysing, and resolving problems)*	1	2	3	4	0	99	98
g. Technical know-how *(Knowing how to use/maintain tools, equipment, monitor operations, and knowledge of the product)*	1	2	3	4	0	99	98
h. Emotional management (*Managing one's own feelings and those of others)*	1	2	3	4	0	99	98
i. Digital (*Use a computer, create a spreadsheet, search and collect information online, software design, adapt to new technology)*	1	2	3	4	0	99	98

NOTE: E4 is repeated for each product in E2

	Scripter: Ask E5 and E6 if any products mentioned in E2 (firm chooses to diversify)
E5	**So far we have dealt with broad classes of skills.** Please provide a detailed description of the most important skills that you predict would be in demand should the establishment choose to diversify into the products you have mentioned? Please be as specific as possible.

	Detailed description of the most important skills required for establishment to diversify into new products		
1			Ask E6
2			Ask E6
3			Ask E6
4			Ask E6
5			Ask E6
	Don't know	99	Go to E7
	Refuse	98	Go to E7

Scripter check: must not be able to fill in a skill & don't know/refuse.

	Scripter autofill with detailed description of skills in E5
E6	**Please rate the typical proficiency of the employees in your existing workforce for each of these specific skills.** *Please use a scale of 1 to 5 where 1= Not competent at all, 2 = a Low level of competence, 3 = Moderately competent, 4 = Very competent and 5= Skill level beyond what is required . If a specific skill is not relevant then you can tick under Not Relevant.*

Scripter: Autofill skills description from E5	**Not competent at all**	**Low level of competence**	**Moderately competent**	**Very competent**	**Skill level beyond what is required**	**Not relevant**	**Don't know**	**Refuse**
	1	2	3	4	5	0	99	98
	1	2	3	4	5	0	99	98
	1	2	3	4	5	0	99	98
	1	2	3	4	5	0	99	98
	1	2	3	4	5	0	99	98

	Scripter: E7 will be repeated for each product in E2
E7 A	**To what degree are the following factors a constraint to this establishment's ability to diversify into …(PRODUCT 1 with detailed description)?** *For each factor, please use a scale of 1 to 5 where 1= it is no obstacle at all, 2= a minor obstacle, 3 =a moderate obstacle, 4 =a major obstacle and 5 =a severe obstacle.*

Product 1							
Constraint	**No obstacle**	**Minor obstacle**	**Moderate obstacle**	**Major obstacle**	**Severe obstacle**	**Don't know**	**Not Applicable**
a. Infrastructure constraints (e.g. *Water; electricity; water; transport; telecommunication; access to land)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
b. Business regulatory constraints (e.g. *Administrative costs associated with licensing and permits; costs of preparing documents; environmental regulations; tax regulations and administration; BBBEE)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
c. Product standardisation and certification (e.g. *Costs of product standardisation, certification, and quality assurance; Capacity constraints at standards, certification and quality assurance authorities, such as the SABS)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
d. Labour regulatory constraints (e.g. *Labour regulations such as Labour Relations Act, Basic Conditions of Employment Act, Employment Equity Act, Skills Act; Union disputes)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
e. Skills and education of available workforce (e.g. *Technical skills; Digital skills; literacy; numeracy; communication; planning; problem solving; physical skills)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
f. Export regulations, procedures and costs	*1*	*2*	*3*	*4*	*5*	*99*	*100*

	(e.g. *Exporting regulations and procedures; financial costs of exporting; ports costs; delays at customs; constraints to accessing markets due to non-tariff barriers; tariff barriers)*							
g.	**Import regulations, procedures and costs** (e.g. *Import regulations and procedures; customs clearance; tariffs)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
h.	**Production constraints** *(e.g. Difficulties in local procurement of intermediate inputs and raw materials; Insufficient production capacity due to lack of facilities)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
i.	**Domestic and foreign competition** *(e.g. Market competition from domestic and/or foreign firms)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
j.	**Financial constraints** *(e.g. Access to and cost of finance)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
k.	**Macroeconomic constraints** *(e.g. Exchange rate level and volatility; domestic demand; foreign market demand; inflation; low growth environment)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
l.	**Crime** *(e.g. Theft; robbery; vandalism; arson; cyber-crime)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*
m.	**Policy uncertainty, government inefficiencies and corruption** *(e.g. Difficulty doing business with government; government corruption; expectation of bribes; policy creating adverse investment environment)*	*1*	*2*	*3*	*4*	*5*	*99*	*100*

NOTE: E7 is repeated for each product in E2

	Scripter: ask E8 if any product mentioned in E2
E8	**Which, if any, policy measures do you think the government could put in place to overcome the constraints the establishment faces when diversifying into these products?** *Please select as many options as are relevant.*

Offering support measures to increase access to finance for capital investments	1
Introducing subsidies or tax rebates to decrease variable production costs e.g., wage subsidies	2
Reducing the administrative and financial burden faced when applying for licenses and permits	3
Offering exclusive production rights	4
Reducing some of the restrictions imposed by labour regulations	5
Upgrading infrastructure to provide reliable utility supply e.g., electricity and water	6
Trade facilitation initiatives (e.g. reducing number of documents required to export, simplifying customs regulations and procedures)	7
Providing access to worker training programmes	8
Improving access to manufacturing expertise from sources such as academia, research, industry, and government	9
Introduce initiatives to incentivise research and development	10
Other, specify in detail	11
Other, specify in detail	
Other, specify in detail	
Don't know	99
Refuse	98

	Scripter: this question is asked only if NO=2 or don't know=9 in E1
E9	**What are the main reasons why your establishment does not see any opportunities for diversifying into new products in the next 5 years?** *Please select as many options as are relevant.*

Business is successful as is	1
No demand for new products	2
Too costly to develop new products	3
Economies of scale are not large enough to warrant diversification	4
Market is already saturated	5
International competition is too strong	6
Capital outlay is too large to develop new products	7
Lack of skilled labour to produce new products	8
Lack of production capacity	9
Poor investment environment	10
Other, specify	11
Other, specify	
Other, specify	
Don't know	99
Refuse	98

We thank you for your valuable time and feedback. Once the study is completed, the MerSETA will provide you with a report of the research findings.

End of section E	Go to Home Page 

SECTION F: FINANCIAL INFORMATION

The Development Policy Research Unit (University of Cape Town's School of Economics) requires basic financial information for TWO pre-COVID financial periods (excluding 2020 Covid period). The purpose of this is to generate a measure productivity, which allows one to analyse the relative productivity of the MER sector and its constituent chambers. In no way is an individual firm's information identifiable in the associated analysis.

This section is best completed by a senior executive in finance or management.

Establishment name	Scripter: Autofill
SDL Number	Scripter: Autofill
Province	Scripter: Autofill
Name of person completing this section	
Position	
Contact number	Leave blank and do not put in any numeric – alpha validations
Email Address	Leave blank and do not put in any numeric – alpha validations

FP1. Could you please provide us with the following basic financial information for the 2020 financial year end (i.e.2019/2020 financial year)

2020 financial year end		R	Refused	Don't know
A	Net Sales		98	99
b	Cost of sales		98	99

FP2.	Did you make a gross profit in the **2020 financial year end?**

Yes	
No	
Refused	
Don't know	

FP3	**Thank you. Could you please provide some further financial information for the 2020 financial year end?**

2020 financial year end		**R**	Refused	Don't know
a.	Other operating income		98	99
b.	Direct labour		98	99

c.	Cost of raw materials		98	99
d.	Gross profit/loss		98	99
e.	Property, plant, and equipment (net book value)		98	99

FP4. In order to generate a **measure of productivity, which allows one to analyse the relative productivity of the MER sector and its constituent chambers, basic information for another financial period is required.** Could you please provide us with basic financial information for an additional **financial period**?

Please indicate which financial period you will be providing information for		Scripter:
2018/2019	1	Show FP5, FP6 and FP7
2017/2018	2	Show FP5, FP6 and FP7
2016/2017	3	Show FP5, FP6 and FP7
2015/2016	4	Show FP5, FP6 and FP7
Do not have	96	Go to the end of section F
Refused	98	Go to the end of section F
Don't know	99	Go to the end of section F

FP5 Please indicate the following information for (SCRIPTER AUTOFILL PERIOD FROM FP4)		R	Refused	Don't know
b	Net Sales		98	99
c	Cost of sales		98	99

FP6	Did you make a gross profit in the (SCRIPTER AUTOFILL PERIOD FROM FP4) **financial year end?**

Yes	
No	
Refused	
Don't know	

FP7	**Thank you. Finally, could you please provide some further financial information for the (SCRIPTER AUTOFILL PERIOD FROM FP4) financial year end?**

		R	Refused	Don't know
a.	Other operating income		98	99
b.	Direct labour		98	99
c.	Cost of raw materials		98	99
d.	Gross profit/loss		98	99
e.	Property, plant, and equipment (net book value)		98	99

We thank you for your valuable time and feedback. Once the study is completed, the MerSETA will provide you with a report of the research findings.

End of section F	Go to Home Page

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