

The Pakistan 2022 World Bank Enterprise Survey Implementation Report

I. Introduction

This document provides information on the World Bank Enterprise Surveys (WBES) implemented in Pakistan between May 2022 and December 2022 (baseline data collection) and in May 2023 (follow-up data collection). The WBES collect both objective data based on firms' day-to-day experiences, and perceptions of enterprises regarding the business environment in which they operate. The WBES currently cover over 180,000 firms in 154 countries with a total of 306 surveys since 2006. The WBES are also used to build a panel of enterprise data that will make it possible to track changes in the business environment over time.¹

This report describes the sampling design of the survey, the data set structure as well as additional information that may be useful when using the data, such as information on survey non-response and the appropriate use of the sampling weights.

II. Sampling Structure

The WBES use stratified random sampling, where the population of establishments is first separated into non-overlapping groups, called strata, and then respondents are selected through simple random sampling from each stratum. The detailed methodology is provided in the Sampling Note.² Stratified random sampling has several advantages over simple random sampling. In particular, it:

- produces unbiased estimates of the whole population or universe of inference, as well as at the levels of stratification
- ensures representativeness by including observations in all of those categories
- produces more precise estimates for a given sample size or budget allocation, and
- may reduce implementation costs by splitting the population into convenient subdivisions.

The WBES typically use three levels of stratification: industry classification, establishment size, and subnational region (used in combination). Starting in 2022, the WBES bases the industry classification on ISIC Rev. 4 (with earlier surveys using ISIC Rev. 3.1).³ For regional coverage within a country, the WBES has national coverage.

¹ A "panel interview" refers to an interview with a business that was also interviewed in the previous WBES.

² The Sampling Note is available at:

https://www.enterprisesurveys.org/content/dam/enterprisesurveys/documents/methodology/Sampling_Note-Consolidated-2-16-22.pdf. For further methodological background see, Richard L. Scheaffer; Mendenhall, W.; Lyman, R., "Elementary Survey Sampling", Fifth Edition, 1996.

³ The WBES universe includes: all manufacturing (ISIC 4.0 codes 10-32), services (ISIC 4.0 codes 33, 41-43, 45-47, 49-56, 58, 61, 62, 69-75, 79, 95). Details on sectoral coverage and the WBES universe of inference can be found in the *Enterprise Surveys Manual and Guide* (p. 4).

II.1 Stratification Categories

The Pakistan 2022 WBES uses the following stratification categories:

- **Industry - 10 categories:**
 - Within manufacturing: Food, Textiles, Garments, Chemicals & Chemical Products, Non-Metallic Mineral Products, Motor Vehicles & Transport Equipment, Other manufacturing
 - Within services: Retail, Accommodation, and Other Services
- **Size - 3 categories:** Small (5 to 19 employees), Medium (20 to 99 employees), Large (100 or more employees)
- **Region - 5 categories:** Punjab, Sindh, Khyber-Pakhtunkhwa, Balochistan, Islamabad

Industry strata for the manufacturing sector were selected by their contribution to total value added, to employment and to total number of establishments, using UNIDO INSTAT 4, available as of summer 2021. The manufacturing sectors stratified separately represent 75%, 84% and 75% of total value added, employment, and number of establishments, respectively, with the rest of sectors grouped into a residual, "Other Manufacturing", stratum. By number of establishments, the manufacturing sectors stratified separately represent 40% of the whole ES universe.

The strata for the services sector were selected by contribution to total number of establishments, using the statistics from the EOBI (Employees' Old-Age Benefits Institution) institution of the Government of Pakistan. The sectors stratified separately represent 36% of the total number of establishments in the services sector, and 11% of the whole ES universe.

Region strata of the Pakistan 2022 WBES were selected based on administrative divisions, leaving out the disputed territories of Gilgit-Baltistan, Azad Jammu and Kashmir.

II.2 Universe

The universe of inference includes all formal (i.e., registered) private sector businesses (with at least 1% private ownership) and with at least five employees. In terms of sectoral criteria, all manufacturing businesses (ISIC Rev 4. codes 10-33) are eligible; for services businesses, those corresponding to the ISIC Rev 4 codes 41-43, 45-47, 49-53, 55-56, 58, 61-62, 69-75, 79, and 95 are included in the Enterprise Surveys. Cooperatives and collectives are excluded from the Enterprise Surveys. All eligible establishments must be registered with the registration agency. In the case of Pakistan, the registration can be from any of the following: SECP Securities and Exchange Commission of Pakistan, Federal Board of Revenue, Board of Revenue Punjab, Sindh Revenue Board, Board of Revenue Balochistan, Board of Revenue Khyber-Pakhtunkhwa, and Drugs Regulatory Authority of Pakistan. The universe table is the total number of eligible establishments, and the table is partitioned by the stratification groups (industry classification, establishment size, and subnational region) in a country.

For the Pakistan 2022 WBES, the universe table, shown in Table 1 below, for manufacturing, small establishments was obtained pulling information from the CMI Pakistan

(census of manufacturing industries), the EOBI (Employees' Old-Age Benefits Institution), and the SHMI (Small and Household Manufacturing Industries) universe tables; for manufacturing medium and large establishments was obtained from the CMI Pakistan; for service, the universe estimate was obtained from a combination of desk research by Sidat Hyder and the EOBI universe tables.

II.3 Sampling Frame

The WBES requires the most complete and up-to-date Sampling Frame, the list of eligible establishments with information on industry classification, size, address and other contact information that will be used to randomly select the sample. In countries where a previous round of the WBES exists, the Sampling Frame also includes the Panel Sampling Frame, which provides information about all the establishments that participated in the previous round of the WBES in the country.

The Sampling Frame for the Pakistan 2022 WBES was constructed from the following sources (see counts of establishments in the frame in Tables 2A). The Panel Sampling Frame was constructed using information on all the establishments that participated in the Pakistan 2013 WBES (Table 2D). The Fresh Sampling Frame, i.e., list of establishments that are in the WBES universe and that have not participated in the Pakistan 2013 WBES, for the manufacturing sector (ISIC 4.0 codes 10-32), was obtained mainly from CMI Pakistan (census of manufacturing industries). However, CMI excludes establishments employing fewer than 10 employees. To fill this gap, the list of formally registered firms employing 5-9 workers from EOBI (Employees' Old-Age Benefits Institution) was used (Table 2C). Due to confidentiality constraints, the Pakistan Bureau of Statistics (PBS) agreed to share only a randomly selected subset of the total number of contacts available in the frame for the manufacturing sector, enough to cover the targets as identified in the design. The exact number of contacts available for combination of stratification categories is available in Table 2B.

In the absence of primary sources, the Fresh Sampling Frame for the services sector (ISIC 4.0 codes 41-43, 45-47, 49, 50-53, 55, 56, 58, 61, 62, 79, 95, see Tables 2A, 2B, and 2C) was put together from secondary sources by the implementing contractor (Sidat Hyder).

For every WBES, necessary measures are taken to ensure the quality of the frame; however, the sample frames are not immune to the typical problems found in establishment surveys: positive rates of non-eligibility, repetition, non-existent units, etc. Given the impact that non-eligible units included in the sample universe may have on the results, eligibility adjustments may be needed when computing the appropriate sampling weights for individual observations (if and only if the weights are computed the sampling frame that is also the universe). In the Pakistan context, the frame for service sectors was available about six months earlier than the frame for manufacturing sectors, therefore the fieldwork started with interviews of retailers, accommodation, and other services; manufacturers were added when they became available. Table 4 reports response outcomes.

II.4 Sample Design

The WBES sample design, i.e., target number of interviews in each combination of stratification categories (cells), is generated using the two primary criteria: 1) minimize the difference from the purely proportional sample within each cell; and 2) achieve a sufficient sample size by stratification category to allow for estimates of a given level of precision.⁴ Additional information on the criteria for determining the sample size by stratification category is given in the *Sampling Note*, and additional information on the sample design is given in the *Enterprise Surveys Manual and Guide*.⁵ The original survey design for the Pakistan 2022 WBES is given in Table 3.

III. Data Collection

The detailed information on the WBES methodology and data collection is provided in the *Enterprise Surveys Manual and Guide*. The baseline interviews for the Pakistan 2022 WBES were conducted between May 2022 and December 2022. The follow-up surveys re-contacted all the establishments that participated in the baseline surveys to collect the variables needed for the B-ready report. The follow-up surveys, with a realization rate of 100%, were conducted in May 2023. The interviews were conducted in the following languages: English, Urdu, Punjabi. For monetary variables, the currency was Pakistani Rupee.

The Pakistan 2022 was not immune from the challenges with participation and call-backs that are standard for all surveys.

III.1 Questionnaire

The standard WBES questionnaire and the follow-up questionnaire cover several topics regarding the business environment and business performance. These topics include general firm characteristics, infrastructure, sales and supplies, management practices, competition, innovation, capacity, land and permits, finance, business-government relations, exposure to bribery, labor, and performance. Information about the general structure of the questionnaire is available in the *Enterprise Surveys Manual and Guide*.

The questionnaire implemented in the Pakistan 2022 WBES included additional questions covering innovation. These questions were selected in collaboration with the members of the WB local country team.

III.2 Contractor

The fieldwork for the Pakistan 2022 WBES was implemented by Sidat Hyder Morshed Associates. The selection for the implementing agency followed the standard World Bank

⁴ Additional constraints are also considered in the design stage. These are generally practical and include, for example, having a sufficient number of available contacts in the sample.

⁵ The *Enterprise Surveys Manual and Guide* is available at:

<https://www.enterprisesurveys.org/content/dam/enterprisesurveys/documents/methodology/Enterprise-Surveys-Manual-and-Guide.pdf>

procurement practices that are described in more detail in the *Enterprise Surveys Manual and Guide*.

III.3 Sampling and screening

Samples are drawn by the Enterprise Surveys team in batches, following the stratification and sample design. The contractor conducted a thorough screening process before scheduling the ES interviews. Results of the screening are provided using the eligibility and status codes as listed in Table 4. In cases of unit non-response (either a refusal or an inability to obtain an interview after exhaustive attempts), the contractor proceeded with the contact that appeared next in the list drawn in the respective cell. The process of sampling and screening is described in more detail in the *Enterprise Surveys Manual and Guide*.

III.4 Survey response

In all surveys, including the WBES, some respondents choose not to participate. The Enterprise Analysis team and the contractor take all necessary measures to boost participation, through various methods of recruitment. The proper management of the screening process and sample replacement ensures that the resulting sample remains random.

The main measure of survey participation is the yield, which is the ratio of the total number of achieved interviews to the total number of contacted establishments. There are two main elements that boost yields. First is the survey participation rate, measured as the share of establishments that participated among those that can be assumed to have been eligible. The second element is the quality of frame. If only a small fraction of the contacted establishments is actually eligible to participate in the survey, then the sampling frame is far from ideal. This quality is measured by the ratio of the total number of establishments that can be assumed to be eligible for the WBES with the total number of contacted establishments in the frame. In other words:

$$Yield = Survey\ response\ rate * Rate\ of\ quality\ of\ the\ frame$$

which can be rewritten as follows:

$$\frac{Total\ interviewed}{Total\ contacted} = \frac{Total\ interviewed}{Assumed\ eligible} * \frac{Assumed\ eligible}{Total\ contacted}$$

Table 5 provides these measures for the Pakistan 2022 WBES baseline and across its stratification levels. All the establishments that participated in the baseline were successfully recontacted and participated in the follow-up survey.

III.5 Achieved Sample

Tables 6 and 7 provide count of the WBES interviews collected for each stratification cell, i.e., broken down by industry, establishment size, and region. Table 6 reports full sample, while Table 7 shows counts of only panel interviews.

III.6 Sampling Weights

Since the WBES uses stratified random sampling, individual observations should be properly weighted when making inferences about the population, since unweighted estimates are

biased unless sample sizes are proportional to the size of each stratum. For each WBES, special care is given to correctly compute sampling weights. Whenever the Universe is used to draw the sample (i.e., Sampling Frame is the same as the Universe, which is not the case for Pakistan where the Sampling Frame and the Universe frame come from different sources) it is imperative to accurately adjust the universe within each stratum to account for the presence of ineligible establishments (e.g., the firm discontinued businesses, or is deemed ineligible due to its business activity or having fewer than five employees). Proper treatment of panel establishments is also crucial. Details about how the WBES sampling weights are calculated are given in the *Sampling Note*.

Three versions of sampling weights are calculated, depending on the assumptions that determine eligibility of establishments to be counted towards the WBES universe. These assumptions are called weak, medium, and strong; and are defined as given in the table below. Prevalence of each of these outcomes for the Pakistan 2022 WBES is given in Table 4. All indicators and analysis conducted by the Enterprise Surveys team use the sampling weights based on the median assumption. Tables 8-10 report estimated universe based on the respective assumption.

Assumption	Eligibility codes for inclusion in the WBES universe
Strict	1,2,3,4,16
Median	1,2,3,4,16,10,11,13
Weak	1,2,3,4,16,10,11,13,91,92,93,94,12

For descriptions of each eligibility code, see Table 4.

III.7 Item response rates

Item response rate must be differentiated from survey response rates. The latter refers to participation in the survey itself (see Section III.4) whereas the former refers to the absence of responses to specific survey questions.⁶ The WBES, as any survey, suffer from item non-response; and different strategies are used by the data collection team to address this. In particular:

- For sensitive questions, such as on corruption or tax evasion, enumerators were instructed to collect the refusal to respond (-8) as a separate response category from don't know (-9).
- Establishments with incomplete information were re-contacted to fill gaps.

Table 11 provides item response rates for several key variables, broken down across the stratification levels.

III.8 Database Structure

The WBES datafiles are organized in ways that reflect the corresponding questionnaire. The variables that are standard across countries have the first letter in their name correspond to the

⁶ The WBES questionnaire is organized so that there is always some entry in the database when the question was posed. An empty entry means that the question was not asked to the corresponding respondent, typically, due to skip patterns, or lack of applicability of that question in general.

questionnaire section where the variable belongs in the questionnaire, i.e., *a1* denotes section A. The variables that are country or region specific are generally named using a prefix in capital letters. These country-specific variables are generally not available beyond the specific country or region where they were implemented. For the Pakistan 2022 WBES, these variables use prefixes PK, SAR. All variables are numeric with the exception of those variables with an “x” at the end of their names. The suffix “x” denotes that the variable is alpha-numeric.

The WBES datafiles contain two establishment identifiers, *idstd* and *id*. The former is a global unique identifier of each establishment, while the latter is unique identifier within each survey. The variable *idstd* can be used to match the WBES establishment one-to-one across databases. The variables *wweak*, *wmedian*, and *wstrong* corresponding to sampling weights based on, respectively, weak, median, and strong assumptions about eligibility (see Section III.6). The variable *strata* corresponds to the stratum of each observation.

Additionally, the WBES datafiles contain many standard variables. The variable *d1a2_v4* denotes the main activity of the establishment, as obtained during the WBES interview, coded in the four-digit ISIC Rev. 4. Users should note that this activity may differ from the industry classification given in the Sampling Frame, *a4a*. Users are generally advised to use industry categories based on the realized information in *d1a2_v4*. Additional sampling information is contained in variables *a2* (region) and *a6a* (size). The variable *panel* identifies panel establishments, i.e., those that participated in the Pakistan 2013 WBES. The combination of *a4a*, *a2*, *a6a*, and *panel* forms stratum of each establishment, which is contained in variable *strata*.

The last complete fiscal year for each establishment is contained in variables *a20m* (last month of last complete fiscal year) and *a20y* (last complete fiscal year).

Note that when an entry in the WBES database is empty, this means that the question was not asked to the corresponding respondent. This happens when the question is deemed inapplicable, due to skip patterns or other reasons. In cases when the question was posed, some entry is provided, including don't know, which is an example of item non-response.

IV. Useful Links

The users of the WBES data may find the following links useful:

- *Sampling Note* is available at:
https://www.enterprisesurveys.org/content/dam/enterprisesurveys/documents/methodology/Sampling_Note-Consolidated-2-16-22.pdf
- The *Enterprise Surveys Manual and Guide* is available at:
<https://www.enterprisesurveys.org/content/dam/enterprisesurveys/documents/methodology/Enterprise-Surveys-Manual-and-Guide.pdf>
- The WBES global questionnaires are available at:
<https://www.enterprisesurveys.org/en/methodology>
- The projects that are currently being implemented by the Enterprise Surveys team are available at: <https://www.enterprisesurveys.org/en/methodology/current-projects>
- The list of all WBES databases and detailed information about each is available here:
<https://www.enterprisesurveys.org/content/dam/enterprisesurveys/documents/methodology/DataDetails.xls>
- The description of the WBES indicators is available at:
<https://www.enterprisesurveys.org/content/dam/enterprisesurveys/documents/Indicator-Description.pdf>

Fact Sheet

Source of Universe Table	Manufacturing: CMI Pakistan (census of manufacturing industries), EOBI (Employees' Old-Age Benefits Institution), and SHMI (Small and Household Manufacturing Industries) universe tables Services: frames by Sidat Hyder, and EOBI universe tables
Source of Sampling Frame	Manufacturing: CMI Pakistan (census of manufacturing industries), EOBI (Employees' Old-Age Benefits Institution) Services: frames by Sidat Hyder
Stratification sectors	Manufacturing of: Food, Textiles, Garments, Chemicals & Chemical Products, Non-Metallic Mineral Products, Motor Vehicles & Transport Equipment, Other manufacturing; Retail, Accommodation, and Other Services
Stratification sizes	Small (5 to 19 employees), Medium (20 to 99 employees), and Large (100 or more employees)
Stratification regions	Punjab, Sindh, Khyber-Pakhtunkhwa, Balochistan, Islamabad
Contractor	Sidat Hyder Morshed Associates
Fieldwork dates	May 2022 – December 2022
Interview languages	English, Urdu, Punjabi
Survey software	Survey Solutions
Currency for nominal variables	Pakistani Rupee
Reference fiscal year	2020 (3 obs.), 2021 (938 obs.) and 2022 (359 obs.)
Sample Size	Total: 1,300 Fresh: 740 Panel: 560
Survey response rates	Yield: 35.5% Response rate: 68.4% Frame quality: 51.9%
Item response rates	d2: 100% n2a: 100% 11: 100% all TFP vars.: 99.5%
Additional topics covered in the questionnaire	Innovation
Additional surveys available (if any)	None

Tables

Table 1: Pakistan 2022 WBES Universe

		Food	Textiles	Garments	Chemicals and Chemical Products	Non Metallic Mineral Products	Motor Vehicles and Tpt Equip	Other Manufacturing	Retail	Accomodation	Other Services	Grand Total
Punjab	Small (5-19)	4563	7162	1298	612	1714	992	16302	3513	2167	7216	65344
Punjab	Medium (20-99)	1065	1050	381	118	8505	132	1507	634	384	2513	
Punjab	Large (100 or more)	288	678	284	124	578	90	820	12	23	619	
Sindh	Small (5-19)	1616	2735	792	179	836	133	2985	932	1488	5297	23442
Sindh	Medium (20-99)	619	633	269	94	208	80	549	52	112	1345	
Sindh	Large (100 or more)	315	482	263	85	167	104	471	26	22	552	
Khyber-Pakhtunkhwa	Small (5-19)	2658	426	390	65	1500	55	10884	1014	382	785	20049
Khyber-Pakhtunkhwa	Medium (20-99)	80	3	2	17	390	3	152	93	36	486	
Khyber-Pakhtunkhwa	Large (100 or more)	24	25	0	20	283	2	124	3	4	143	
Balochistan	Small (5-19)	297	495	125	6	52	1	133	211	98	205	2154
Balochistan	Medium (20-99)	85	2	0	1	8	2	29	6	64	202	
Balochistan	Large (100 or more)	9	11	0	3	5	6	38	1	0	59	
Islamabad	Small (5-19)	63	5	8	17	117	0	77	284	533	1217	3493
Islamabad	Medium (20-99)	32	1	1	1	3	1	73	18	125	504	
Islamabad	Large (100 or more)	21	1	2	1	5	2	57	3	7	314	
		11736	13709	3815	1343	14371	1602	34201	6802	5445	21457	114482

Source: Manufacturing: CMI Pakistan (census of manufacturing industries), EOBI (Employees' Old-Age Benefits Institution), and SHMI (Small and Household Manufacturing Industries) universe tables. Services: frames by Sidat Hyder, and EOBI universe tables.

Table 2A: Pakistan 2022 PBS Sample Frame (Fresh and Panel Combined)

		Food	Textiles	Garments	Chemicals and Chemical Products	Non Metallic Mineral Products	Motor Vehicles and Tpt Equip	Other Manufacturing	Retail	Accomodation	Other Services	Grand Total
Punjab	Small (5-19)	3184	5306	1325	626	1187	506	9342	1527	1111	7232	51530
Punjab	Medium (20-99)	1106	1093	410	133	8525	138	1590	642	393	2514	
Punjab	Large (100 or more)	298	716	304	137	582	93	859	12	18	621	
Sindh	Small (5-19)	1327	863	305	180	198	87	977	813	1490	5304	18093
Sindh	Medium (20-99)	642	637	270	95	210	80	559	40	85	1358	
Sindh	Large (100 or more)	325	500	276	91	168	111	488	27	27	560	
Khyber-Pakhtunkhwa	Small (5-19)	325	33	4	79	1546	8	682	1014	387	795	6853
Khyber-Pakhtunkhwa	Medium (20-99)	94	8	2	29	405	4	168	95	40	493	
Khyber-Pakhtunkhwa	Large (100 or more)	28	26	0	23	286	2	129	0	5	143	
Balochistan	Small (5-19)	128	8	1	8	53	1	59	211	101	206	1337
Balochistan	Medium (20-99)	87	3	0	2	9	2	32	5	64	204	
Balochistan	Large (100 or more)	12	16	0	7	9	8	41	1	0	59	
Islamabad	Small (5-19)	67	6	9	17	48	0	84	285	533	1218	3513
Islamabad	Medium (20-99)	58	2	3	4	12	1	84	26	127	506	
Islamabad	Large (100 or more)	22	1	2	1	6	2	59	3	8	319	
		7703	9218	2911	1432	13244	1043	15153	4701	4389	21532	81326

Source: Manufacturing: CMI Pakistan (census of manufacturing industries), EOBI (Employees' Old-Age Benefits Institution). Services: frames by Sidat Hyder.

Table 2B: Pakistan 2022 WBES Sample Frame (Fresh and Panel Combined)

		Food	Textiles	Garments	Chemicals and Chemical Products	Non Metallic Mineral Products	Motor Vehicles and Tpt Equip	Other Manufacturing	Retail	Accommodation	Other Services	Grand Total
Punjab	Small (5-19)	79	129	96	53	53	141	251	1527	1111	7232	16004
Punjab	Medium (20-99)	71	97	95	72	119	66	131	642	393	2514	
Punjab	Large (100 or more)	37	104	89	85	19	42	105	12	18	621	
Sindh	Small (5-19)	31	33	31	13	27	73	80	813	1490	5304	11115
Sindh	Medium (20-99)	77	24	20	87	39	70	57	40	85	1358	
Sindh	Large (100 or more)	49	73	271	98	72	113	73	27	27	560	
Khyber-Pakhtunkhwa	Small (5-19)	35	19	0	53	70	8	141	1014	387	795	3537
Khyber-Pakhtunkhwa	Medium (20-99)	29	8	0	35	54	4	28	95	40	493	
Khyber-Pakhtunkhwa	Large (100 or more)	18	12	0	11	17	0	23	0	5	143	
Balochistan	Small (5-19)	54	11	0	12	11	0	48	211	101	206	1205
Balochistan	Medium (20-99)	73	5	0	2	9	3	18	5	64	204	
Balochistan	Large (100 or more)	15	19	0	7	8	12	47	1	0	59	
Islamabad	Small (5-19)	19	6	8	9	13	0	22	285	533	1218	3260
Islamabad	Medium (20-99)	62	2	3	4	12	0	41	26	127	506	
Islamabad	Large (100 or more)	11	0	0	0	6	0	17	3	8	319	
		660	542	613	541	529	532	1,082	4,701	4,389	21,532	35,121

Source: Manufacturing: CMI Pakistan (census of manufacturing industries), EOBI (Employees' Old-Age Benefits Institution). Services: frames by Sidat Hyder.

Table 2C: Pakistan 2022 WBES Fresh Sample Frame

		Food	Textiles	Garments	Chemicals and Chemical Products	Non Metallic Mineral Products	Motor Vehicles and Tpt Equip	Other Manufacturing	Retail	Accomodation	Other Services	Grand Total
Punjab	Small (5-19)	3138	5276	1298	612	1161	500	9244	1518	1103	7216	50862
Punjab	Medium (20-99)	1065	1050	381	118	8505	132	1507	634	384	2513	
Punjab	Large (100 or more)	288	678	284	124	578	90	820	10	16	619	
Sindh	Small (5-19)	1314	861	300	179	192	85	960	805	1488	5297	17878
Sindh	Medium (20-99)	619	633	269	94	208	80	549	35	78	1345	
Sindh	Large (100 or more)	315	482	263	85	167	104	471	26	22	552	
Khyber-Pakhtunkhwa	Small (5-19)	314	28	4	65	1500	6	656	1014	382	785	6641
Khyber-Pakhtunkhwa	Medium (20-99)	80	3	2	17	390	3	152	93	36	486	
Khyber-Pakhtunkhwa	Large (100 or more)	24	25	0	20	283	2	124	0	4	143	
Balochistan	Small (5-19)	115	6	1	6	52	1	51	211	98	205	1276
Balochistan	Medium (20-99)	85	2	0	1	8	2	29	5	64	202	
Balochistan	Large (100 or more)	9	11	0	3	5	6	38	1	0	59	
Islamabad	Small (5-19)	63	5	8	17	46	0	77	284	533	1217	3422
Islamabad	Medium (20-99)	32	1	1	1	3	1	73	18	125	504	
Islamabad	Large (100 or more)	21	1	2	1	5	2	57	3	7	314	
		7482	9062	2813	1343	13103	1014	14808	4657	4340	21457	80079

Source: Manufacturing: CMI Pakistan (census of manufacturing industries), EOBI (Employees' Old-Age Benefits Institution). Services: frames by Sidat Hyder.

Table 2D: Pakistan 2022 WBES Panel Sample Frame

		Food	Textiles	Garments	Chemicals and Chemical Products	Non Metallic Mineral Products	Motor Vehicles and Tpt Equip	Other Manufacturing	Retail	Accomodation	Other Services	Grand Total
Punjab	Small (5-19)	46	30	27	14	26	6	98	9	8	16	668
Punjab	Medium (20-99)	41	43	29	15	20	6	83	8	9	1	
Punjab	Large (100 or more)	10	38	20	13	4	3	39	2	2	2	
Sindh	Small (5-19)	13	2	5	1	6	2	17	8	2	7	215
Sindh	Medium (20-99)	23	4	1	1	2	0	10	5	7	13	
Sindh	Large (100 or more)	10	18	13	6	1	7	17	1	5	8	
Khyber-Pakhtunkhwa	Small (5-19)	11	5	0	14	46	2	26	0	5	10	212
Khyber-Pakhtunkhwa	Medium (20-99)	14	5	0	12	15	1	16	2	4	7	
Khyber-Pakhtunkhwa	Large (100 or more)	4	1	0	3	3	0	5	0	1	0	
Balochistan	Small (5-19)	13	2	0	2	1	0	8	0	3	1	61
Balochistan	Medium (20-99)	2	1	0	1	1	0	3	0	0	2	
Balochistan	Large (100 or more)	3	5	0	4	4	2	3	0	0	0	
Islamabad	Small (5-19)	4	1	1	0	2	0	7	1	0	1	91
Islamabad	Medium (20-99)	26	1	2	3	9	0	11	8	2	2	
Islamabad	Large (100 or more)	1	0	0	0	1	0	2	0	1	5	
		221	156	98	89	141	29	345	44	49	75	1247

Source: Manufacturing: CMI Pakistan (census of manufacturing industries), EOBI (Employees' Old-Age Benefits Institution). Services: frames by Sidat Hyder.

Table 3: Original Survey Design (Fresh and Panel Combined)

		Food	Textiles	Garments	Chemicals and Chemical Products	Non Metallic Mineral Products	Motor Vehicles and Tpt Equip	Other Manufacturing	Retail	Accomodation	Other Services	Grand Total
Punjab	Small (5-19)	10	32	22	12	8	44	50	13	10	24	528
Punjab	Medium (20-99)	10	18	22	19	33	20	16	21	12	6	
Punjab	Large (100 or more)	9	22	23	24	5	13	22	2	3	3	
Sindh	Small (5-19)	5	6	6	3	6	11	15	8	7	14	325
Sindh	Medium (20-99)	18	5	3	12	3	10	9	8	14	12	
Sindh	Large (100 or more)	9	15	41	14	21	17	14	4	7	8	
Khyber-Pakhtunkhwa	Small (5-19)	7	4	0	12	7	2	37	2	6	4	167
Khyber-Pakhtunkhwa	Medium (20-99)	4	4	0	10	13	1	4	12	7	6	
Khyber-Pakhtunkhwa	Large (100 or more)	5	3	0	4	4	0	6	0	1	2	
Balochistan	Small (5-19)	11	2	0	2	3	0	8	25	14	3	140
Balochistan	Medium (20-99)	9	1	0	1	2	0	5	1	8	14	
Balochistan	Large (100 or more)	3	5	0	3	4	2	7	0	0	7	
Islamabad	Small (5-19)	4	2	2	2	3	0	4	16	13	4	140
Islamabad	Medium (20-99)	20	1	1	2	6	0	10	8	16	3	
Islamabad	Large (100 or more)	4	0	0	0	2	0	5	0	2	10	
		128	120	120	120	120	120	212	120	120	120	1300

Table 4: Response Outcomes

		Totals	Rates relative to total contacted
Overall	Contacts available in frame	35,121	
	Issued	4,059	
	Contacted	3,660	
Screening phase	Eligibles	1,442	39.4%
	Screener refusals	457	12.5%
	Assumed eligibles	1,900	51.9%
	Ineligible + out of target	635	17.3%
	Unobtainables	1,126	30.8%
Interview phase (only if eligible)	Interview refusals	142	3.9%
	Complete interviews	1,300	35.5%

		Totals	Rates relative to total contacted
Overall	Contacts available in frame	35,121	
	Issued	4,059	
	Contacted	3,660	
Screening phase	Eligibles	1,442	39.4%
	Screener refusals	457	12.5%
	Assumed eligibles	1,900	51.9%
	Ineligible + out of target	635	17.3%
	Unobtainables	1,126	30.8%
Interview phase (only if eligible)	Interview refusals	142	3.9%
	Complete interviews	1,300	35.5%

Table 5: Survey Yield Rates

Stratification		Yield	Survey response rate	Frame quality
Panel	Fresh	28.5%	61.6%	46.3%
	Panel	52.7%	80.2%	65.7%
Size	Small (5-19)	44.0%	81.3%	54.1%
	Medium (20-99)	37.6%	75.5%	49.8%
	Large (100+)	25.3%	48.6%	52.0%
Region	Punjab	50.1%	88.1%	56.9%

	Sindh	19.5%	37.8%	51.7%
	Khyber-Pakhtunkhwa	48.6%	93.8%	51.9%
	Balochistan	28.7%	66.5%	43.1%
	Islamabad	45.8%	91.3%	50.2%
Sector	Food	41.2%	74.1%	55.6%
	Textiles	39.1%	70.6%	55.4%
	Garments	28.3%	62.5%	45.3%
	Chemicals & Chemical Products	29.7%	57.1%	52.0%
	Non-Metallic Mineral Products	47.5%	83.2%	57.1%
	Motor Vehicles & Transport Equip.	30.5%	55.6%	54.8%
	Other Manufacturing	40.2%	74.3%	54.1%
	Retail	37.5%	78.0%	48.1%
	Accommodation	36.8%	71.5%	51.5%
	Other Services	30.5%	63.5%	48.0%
Overall	Pakistan 2022	35.5%	68.4%	51.9%

Notes: the rates are calculated as defined in Section III.4.

Table 6: Achieved Total Sample (Fresh and Panel Combined)

		Food	Textiles	Garments	Chemicals and Chemical Products	Non Metallic Mineral Products	Motor Vehicles and Tpt Equip	Other Manufacturing	Retail	Accomodation	Other Services	Grand Total
Punjab	Small (5-19)	10	32	22	12	8	44	51	13	10	24	565
Punjab	Medium (20-99)	10	22	26	23	34	20	16	21	12	10	
Punjab	Large (100 or more)	9	22	28	28	5	22	22	3	3	3	
Sindh	Small (5-19)	5	6	6	2	6	11	15	7	8	14	256
Sindh	Medium (20-99)	16	6	11	11	3	10	7	9	13	10	
Sindh	Large (100 or more)	7	8	23	1	20	5	2	3	7	4	
Khyber-Pakhtunkhwa	Small (5-19)	7	4	0	12	7	3	37	2	6	4	180
Khyber-Pakhtunkhwa	Medium (20-99)	4	5	0	12	13	2	4	12	7	6	
Khyber-Pakhtunkhwa	Large (100 or more)	5	4	0	10	4	0	6	0	2	2	
Balochistan	Small (5-19)	12	3	0	3	4	0	9	31	14	5	153
Balochistan	Medium (20-99)	10	1	0	1	3	1	5	2	9	14	
Balochistan	Large (100 or more)	3	3	0	1	4	2	6	0	0	7	
Islamabad	Small (5-19)	4	3	3	3	3	0	4	16	13	4	146
Islamabad	Medium (20-99)	20	1	1	1	7	0	10	8	16	3	
Islamabad	Large (100 or more)	4	0	0	0	3	0	5	1	3	10	
		126	120	120	120	124	120	199	128	123	120	1300

Table 7: Achieved Panel Sample

		Food	Textiles	Garments	Chemicals and Chemical Products	Non Metallic Mineral Products	Motor Vehicles and Tpt Equip	Other Manufacturing	Retail	Accomodation	Other Services	Grand Total
Punjab	Small (5-19)	2	20	19	10	5	4	21	6	6	11	286
Punjab	Medium (20-99)	8	19	22	10	14	4	13	6	6	1	
Punjab	Large (100 or more)	7	20	15	9	3	2	20	1	1	1	
Sindh	Small (5-19)	2	1	4	0	4	1	10	5	1	5	91
Sindh	Medium (20-99)	13	3	1	0	1	0	4	4	3	7	
Sindh	Large (100 or more)	5	5	5	0	0	1	0	0	4	2	
Khyber-Pakhtunkhwa	Small (5-19)	2	2	0	10	4	1	18	0	4	2	93
Khyber-Pakhtunkhwa	Medium (20-99)	2	4	0	8	11	1	2	1	3	4	
Khyber-Pakhtunkhwa	Large (100 or more)	3	1	0	3	2	0	4	0	1	0	
Balochistan	Small (5-19)	9	1	0	1	1	0	6	0	2	1	30
Balochistan	Medium (20-99)	1	0	0	1	1	0	2	0	0	1	
Balochistan	Large (100 or more)	1	0	0	0	2	0	0	0	0	0	
Islamabad	Small (5-19)	2	1	1	0	1	0	2	1	0	1	60
Islamabad	Medium (20-99)	18	1	1	1	6	0	8	6	1	1	
Islamabad	Large (100 or more)	1	0	0	0	1	0	1	0	1	4	
		76	78	68	53	56	14	111	30	33	41	560

Table 8: Weak Universe Estimates

		Food	Textiles	Garments	Chemicals and Chemical Products	Non Metallic Mineral Products	Motor Vehicles and Tpt Equip	Other Manufacturing	Retail	Accomodation	Other Services	Garment and Textiles	Other Mfg and Motor Vehicles	Grand Total
Punjab	Small (5-19)	4563	7162	1325	626	1714	992	16302	3513	2167	7232	0	0	65785
Punjab	Medium (20-99)	1106	1093	410	133	8525	138	1590	642	393	2514	0	0	
Punjab	Large (100 or more)	298	716	304	137	582	93	859	12	23	621	0	0	
Sindh	Small (5-19)	1616	0	792	180	836	133	2985	932	1490	5304	0	0	23602
Sindh	Medium (20-99)	642	0	270	95	210	80	559	53	112	0	0	0	
Sindh	Large (100 or more)	325	500	276	98	168	113	488	27	28	0	0	0	
Sindh	Medium and Large (20 or more)	0	0	0	0	0	0	0	0	0	1918	0	0	
Sindh	Small and Medium (5-99)	0	3372	0	0	0	0	0	0	0	0	0	0	
Khyber-Pakhtunkhwa	Small (5-19)	2658	0	0	79	1546	55	10884	1014	387	795	816	0	20225
Khyber-Pakhtunkhwa	Medium (20-99)	94	0	0	35	405	0	168	0	41	493	10	0	
Khyber-Pakhtunkhwa	Large (100 or more)	28	26	0	23	286	0	129	0	5	143	0	0	
Khyber-Pakhtunkhwa	Medium and Large (20 or more)	0	0	0	0	0	6	0	98	0	0	0	0	
Balochistan	Small (5-19)	297	0	0	12	53	0	133	211	101	206	620	0	2215
Balochistan	Medium (20-99)	87	5	0	2	9	0	32	0	64	204	0	0	
Balochistan	Large (100 or more)	15	19	0	7	9	12	47	0	0	59	0	0	
Balochistan	Medium and Large (20 or more)	0	0	0	0	0	0	0	7	0	0	0	0	
Balochistan	Small and Medium (5-99)	0	0	0	0	0	4	0	0	0	0	0	0	
Islamabad	Small (5-19)	67	6	9	17	117	0	84	285	533	1218	0	0	3587
Islamabad	Medium (20-99)	62	0	0	0	13	0	0	26	127	506	0	85	
Islamabad	Large (100 or more)	22	0	0	0	6	0	0	3	8	319	0	61	
Islamabad	Medium and Large (20 or more)	0	3	5	5	0	0	0	0	0	0	0	0	
		11881	12902	3391	1449	14479	1625	34260	6823	5479	21532	1447	146	115414

Table 9: Median Universe Estimates

		Food	Textiles	Garments	Chemicals and Chemical Products	Non Metallic Mineral Products	Motor Vehicles and Tpt Equip	Other Manufacturing	Retail	Accomodation	Other Services	Garment and Textiles	Other Mfg and Motor Vehicles	Grand Total
Punjab	Small (5-19)	4563	7162	1325	626	1714	992	16302	3513	2167	7232	0	0	65785
Punjab	Medium (20-99)	1106	1093	410	133	8525	138	1590	642	393	2514	0	0	
Punjab	Large (100 or more)	298	716	304	137	582	93	859	12	23	621	0	0	
Sindh	Small (5-19)	1616	0	792	180	836	133	2985	932	1490	5304	0	0	23602
Sindh	Medium (20-99)	642	0	270	95	210	80	559	53	112	0	0	0	
Sindh	Large (100 or more)	325	500	276	98	168	113	488	27	28	0	0	0	
Sindh	Medium and Large (20 or more)	0	0	0	0	0	0	0	0	0	1918	0	0	
Sindh	Small and Medium (5-99)	0	3372	0	0	0	0	0	0	0	0	0	0	
Khyber-Pakhtunkhwa	Small (5-19)	2658	0	0	79	1546	55	10884	1014	387	795	816	0	20224
Khyber-Pakhtunkhwa	Medium (20-99)	94	0	0	35	405	0	168	0	41	493	10	0	
Khyber-Pakhtunkhwa	Large (100 or more)	28	26	0	23	286	0	129	0	5	143	0	0	
Khyber-Pakhtunkhwa	Medium and Large (20 or more)	0	0	0	0	0	6	0	98	0	0	0	0	
Balochistan	Small (5-19)	297	0	0	12	53	0	133	211	101	206	620	0	2215
Balochistan	Medium (20-99)	87	5	0	2	9	0	32	0	64	204	0	0	
Balochistan	Large (100 or more)	15	19	0	7	9	12	47	0	0	59	0	0	
Balochistan	Medium and Large (20 or more)	0	0	0	0	0	0	0	7	0	0	0	0	
Balochistan	Small and Medium (5-99)	0	0	0	0	0	4	0	0	0	0	0	0	
Islamabad	Small (5-19)	67	6	9	17	117	0	84	285	533	1218	0	0	3587
Islamabad	Medium (20-99)	62	0	0	0	13	0	0	26	127	506	0	85	
Islamabad	Large (100 or more)	22	0	0	0	6	0	0	3	8	319	0	61	
Islamabad	Medium and Large (20 or more)	0	3	5	5	0	0	0	0	0	0	0	0	
		11881	12902	3391	1449	14479	1625	34260	6823	5479	21532	1447	146	115413

Table 10: Strict Universe Estimates

		Food	Textiles	Garments	Chemicals and Chemical Products	Non Metallic Mineral Products	Motor Vehicles and Tpt Equip	Other Manufacturing	Retail	Accomodation	Other Services	Garment and Textiles	Other Mfg and Motor Vehicles	Grand Total
Punjab	Small (5-19)	4563	7162	1325	626	1714	992	16302	3513	2167	7232	0	0	65785
Punjab	Medium (20-99)	1106	1093	410	133	8525	138	1590	642	393	2514	0	0	
Punjab	Large (100 or more)	298	716	304	137	582	93	859	12	23	621	0	0	
Sindh	Small (5-19)	1616	0	792	180	836	133	2985	932	1490	5304	0	0	23602
Sindh	Medium (20-99)	642	0	270	95	210	80	559	53	112	0	0	0	
Sindh	Large (100 or more)	325	500	276	98	168	113	488	27	28	0	0	0	
Sindh	Medium and Large (20 or more)	0	0	0	0	0	0	0	0	0	1918	0	0	
Sindh	Small and Medium (5-99)	0	3372	0	0	0	0	0	0	0	0	0	0	
Khyber-Pakhtunkhwa	Small (5-19)	2658	0	0	79	1546	55	10884	1014	387	795	816	0	20224
Khyber-Pakhtunkhwa	Medium (20-99)	94	0	0	35	405	0	168	0	41	493	10	0	
Khyber-Pakhtunkhwa	Large (100 or more)	28	26	0	23	286	0	129	0	5	143	0	0	
Khyber-Pakhtunkhwa	Medium and Large (20 or more)	0	0	0	0	0	6	0	98	0	0	0	0	
Balochistan	Small (5-19)	297	0	0	12	53	0	133	211	101	206	620	0	2215
Balochistan	Medium (20-99)	87	5	0	2	9	0	32	0	64	204	0	0	
Balochistan	Large (100 or more)	15	19	0	7	9	12	47	0	0	59	0	0	
Balochistan	Medium and Large (20 or more)	0	0	0	0	0	0	0	7	0	0	0	0	
Balochistan	Small and Medium (5-99)	0	0	0	0	0	4	0	0	0	0	0	0	
Islamabad	Small (5-19)	67	6	9	17	117	0	84	285	533	1218	0	0	3587
Islamabad	Medium (20-99)	62	0	0	0	13	0	0	26	127	506	0	85	
Islamabad	Large (100 or more)	22	0	0	0	6	0	0	3	8	319	0	61	
Islamabad	Medium and Large (20 or more)	0	3	5	5	0	0	0	0	0	0	0	0	
		11881	12902	3391	1449	14479	1625	34260	6823	5479	21532	1446	146	115413

Table 11: Item Response Rates

	 Screener/Interview	 d2	 I1	 n2a	 all TFP variables
Panel	Fresh	100.0%	100.0%	100.0%	100.0%
	Panel	100.0%	100.0%	100.0%	99.0%
Size	Small (5-19)	100.0%	100.0%	100.0%	99.1%
	Medium (20-99)	100.0%	100.0%	100.0%	99.4%
	Large (100+)	100.0%	100.0%	100.0%	100.0%
Region	Punjab	100.0%	100.0%	100.0%	99.6%
	Sindh	100.0%	100.0%	100.0%	100.0%
	Khyber-Pakhtunkhwa	100.0%	100.0%	100.0%	99.2%
	Balochistan	100.0%	100.0%	100.0%	98.5%
	Islamabad	100.0%	100.0%	100.0%	100.0%
Sector	Accommodation	100.0%	100.0%	100.0%	0.0%
	Chemicals & Chemical Products	100.0%	100.0%	100.0%	100.0%
	Food	100.0%	100.0%	100.0%	100.0%
	Garments	100.0%	100.0%	100.0%	99.2%
	Motor Vehicles & Transport Equip.	100.0%	100.0%	100.0%	100.0%
	Non-Metallic Mineral Products	100.0%	100.0%	100.0%	100.0%
	Other Manufacturing	100.0%	100.0%	100.0%	98.5%
	Other Services	100.0%	100.0%	100.0%	0.0%
	Retail	100.0%	100.0%	100.0%	0.0%
	Textiles	100.0%	100.0%	100.0%	100.0%
Overall	Pakistan 2022	100.0%	100.0%	100.0%	99.5%

Notes: the rates are calculated as follows. The number of responses with informative content in the respective variable (or combination of variables in the case of TFP) is divided by the same number plus the number of responses that are "don't know" (code -9) or refusal (code -8).