The Rwanda 2023 World Bank Enterprise Survey
Implementation Report

I. Introduction

This document provides information on the World Bank Enterprise Surveys (WBES) implemented in Rwanda between May 2023 and February 2024. 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 207,000 firms in 158 countries with a total of 333 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.

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[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 10-33), services (ISIC 4.0 codes 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 Rwanda 2023 WBES uses the following stratification categories:

- **Industry: 3 categories**:
  - Manufacturing
  - Within services: Retail, and Other Services
- **Size: 3 categories**: Small (5 to 19 employees), Medium (20 to 99 employees), Large (100 or more employees)
- **Region: 3 categories**: Kigali; Western and Northern; Southern and Eastern

Region strata of the Rwanda 2023 WBES were selected based on administrative divisions, with some territories grouped to achieve the minimum required precision of estimates at the level of each stratification region. In particular, Western and Northern comprised of Western and Northern Provinces; Southern and Eastern comprised of Southern and Eastern Provinces followed existing administrative divisions within Rwanda.

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 Rwanda, registration was from the Rwanda Revenue Authority (RRA). 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 Rwanda 2023 WBES, the universe table, shown in Table 1 below, was obtained from the National Institute of Statistics Rwanda (NISR).

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 Rwanda 2023 WBES was constructed from the following sources (see counts of establishments in the frame in Table 2). The Panel Sampling Frame was constructed using information on all the establishments that participated in the Rwanda 2019 WBES. The Fresh Sampling Frame, i.e., list of establishments that are in the WBES universe and that have not participated in the Rwanda 2019 WBES, for the manufacturing sector (ISIC 4.0 codes 10-32), was obtained from the National Institute of Statistics Rwanda (NISR).

The Fresh Sampling Frame for the services sector (ISIC 4.0 codes 41-43, 45-47, 49-56, 58, 61, 62, 69-75, 79, 95) is from the National Institute of Statistics Rwanda (NISR).

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). 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 Rwanda 2023 WBES is given in Table 3.

III. Data Collection

Detailed information on the WBES methodology and data collection is provided in the Enterprise Surveys Manual and Guide. The interviews for the Rwanda 2023 WBES were conducted between May 2023 and February 2024. The interviews were conducted in Kinyarwanda.

III.1 Questionnaire

The standard WBES questionnaire covers 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 Rwanda 2023 WBES included additional questions tailored for the Business Ready Report covering infrastructure, trade, government regulations, finance, labor, and other topics.

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[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

III.2 Contractor

The fieldwork for the Rwanda 2023 WBES was implemented by Verian, formerly known as Kantar Public, the main contractor, in collaboration with OutReach Development Solutions (ODS). The selection for the implementing agency followed the standard World Bank 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 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 Rwanda 2023 WBES and across its stratification levels.

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) 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 Rwanda 2023 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
Median	1,2,3,4,10,11,13
Weak	1,2,3,4,10,11,13,91,92,93,94,12

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.

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[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.

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 questionnaire section where the variable belongs in the questionnaire, i.e., *a1* denotes section *A*. 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.[7]

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 Rwanda 2019 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.

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[7] Note that the sampling weights may vary within *strata* for panel establishments due to the procedure used for projecting the universe from the previous round of the survey.

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/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	National Institute of Statistics Rwanda (NISR)
Source of Sampling Frame	National Institute of Statistics Rwanda (NISR)
Stratification sectors	Manufacturing; Retail, and Other Services
Stratification sizes	Small (5 to 19 employees), Medium (20 to 99 employees), Large (100 or more employees)
Stratification regions	Kigali; Western and Northern; Southern and Eastern
Contractor	Main contractor: Verian, formerly known as Kantar Public Sub-contractor: OutReach Development Solutions (ODS)
Fieldwork dates	May 2023 – February 2024
Interview languages	Kinyarwanda
Survey software	Survey Solutions
Currency for nominal variables	Rwandan Franc
Reference fiscal year	2022 (291 obs.) and 2023 (67 obs.)
Sample Size	Total: 358 Fresh: 243 Panel: 115
Survey response rates	Yield: 23.9% Response rate: 51.7% Frame quality: 46.3%
Item response rates	d2: 100% n2a: 97.5% l1: 99.7% all TFP vars.: 78%
Additional topics covered in the questionnaire	None
Additional surveys available (if any)	None

Tables

Table 1: Rwanda 2023 WBES Universe

		Manufacturing	Retail	Other Services	Grand Total
Kigali	Small (5-19)	341	520	1367	**2,680**
Kigali	Medium (20-99)	93	75	222	
Kigali	Large (100 or more)	23	6	33	
Western and Northern	Small (5-19)	404	147	571	**1,381**
Western and Northern	Medium (20-99)	93	39	92	
Western and Northern	Large (100 or more)	18	7	10	
Southern and Eastern	Small (5-19)	400	207	608	**1,506**
Southern and Eastern	Medium (20-99)	135	31	90	
Southern and Eastern	Large (100 or more)	21	1	13	
		1,528	**1,033**	**3,006**	**5,567**

Source: National Institute of Statistics Rwanda (NISR)

Table 2: Rwanda 2023 WBES Sample Frame (Fresh and Panel Combined)

		Manufacturing	Retail	Other Services	Grand Total
Kigali	Small (5-19)	347	540	1405	**2,838**
Kigali	Medium (20-99)	110	91	239	
Kigali	Large (100 or more)	43	7	56	
Western and Northern	Small (5-19)	423	167	588	**1,480**
Western and Northern	Medium (20-99)	107	40	116	
Western and Northern	Large (100 or more)	21	7	11	
Southern and Eastern	Small (5-19)	429	236	620	**1,605**
Southern and Eastern	Medium (20-99)	143	35	105	
Southern and Eastern	Large (100 or more)	23	1	13	
		1,646	**1,124**	**3,153**	**5,923**

Source: National Institute of Statistics Rwanda (NISR)

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

		Manufacturing	Retail	Other Services	Grand Total
Kigali	Small (5-19)	8	11	25	**120**
Kigali	Medium (20-99)	4	5	6	
Kigali	Large (100 or more)	22	7	32	
Western and Northern	Small (5-19)	9	30	14	**120**
Western and Northern	Medium (20-99)	26	9	20	
Western and Northern	Large (100 or more)	7	2	3	
Southern and Eastern	Small (5-19)	9	31	13	**120**
Southern and Eastern	Medium (20-99)	26	12	17	
Southern and Eastern	Large (100 or more)	8	1	3	
		120	**108**	**132**	**360**

Table 4: Response Outcomes

		Totals	Rates relative to total contacted
Overall	Contacts available in frame	5,923	
	Issued	1,645	
	Contacted	1,495	
Screening phase	Eligibles	649	43.4%
	Screener refusals	37	2.5%
	Assumed eligibles	692	46.3%
	Ineligible + out of target	641	42.9%
	Unobtainables	121	8.1%
Interview phase	Interview refusals	225	15.1%
(only if eligible)	Complete interviews	358	23.9%

Table 5: Survey Yield Rates

	Stratification	Yield	Survey response rate	Frame quality
Panel	Fresh	19.2%	47.8%	40.2%
	Panel	49.6%	62.5%	79.3%
Size	Small (5-19)	23.7%	52.6%	45.1%
	Medium (20-99)	21.6%	50.0%	43.3%
	Large (100+)	32.9%	53.3%	61.8%
Region	Kigali	30.3%	51.2%	59.2%
	Western and Northern	21.8%	55.5%	39.3%
	Southern and Eastern	21.3%	49.0%	43.5%
Sector	Manufacturing	23.9%	48.4%	49.3%
	Retail	23.9%	61.7%	38.7%
	Other Services	24.1%	48.9%	49.2%
Overall	Rwanda 2023	23.9%	51.7%	46.3%

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

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

		Manufacturing	Retail	Other Services	Grand Total
Kigali	Small (5-19)	10	20	29	**124**
Kigali	Medium (20-99)	7	10	10	
Kigali	Large (100 or more)	13	5	20	
Western and Northern	Small (5-19)	13	21	18	**116**
Western and Northern	Medium (20-99)	24	4	24	
Western and Northern	Large (100 or more)	10	1	1	
Southern and Eastern	Small (5-19)	13	29	18	**118**
Southern and Eastern	Medium (20-99)	24	10	17	
Southern and Eastern	Large (100 or more)	6	0	1	
		120	**100**	**138**	**358**

Table 7: Achieved Panel Sample

		Manufacturing	Retail	Other Services	Grand Total
Kigali	Small (5-19)	1	3	2	**39**
Kigali	Medium (20-99)	2	4	1	
Kigali	Large (100 or more)	9	4	13	
Western and Northern	Small (5-19)	2	10	3	**35**
Western and Northern	Medium (20-99)	6	0	12	
Western and Northern	Large (100 or more)	1	0	1	
Southern and Eastern	Small (5-19)	2	19	1	**41**
Southern and Eastern	Medium (20-99)	6	2	10	
Southern and Eastern	Large (100 or more)	1	0	0	
		30	**42**	**43**	**115**

Table 8: Weak Universe Estimates

		Manufacturing	Retail	Other Services	Grand Total
Kigali	Small (5-19)	239	263	944	**1,740**
Kigali	Medium (20-99)	61	35	143	
Kigali	Large (100 or more)	18	6	33	
Western and Northern	Small (5-19)	185	49	259	**606**
Western and Northern	Medium (20-99)	40	12	43	
Western and Northern	Large (100 or more)	10	3	5	
Southern and Eastern	Small (5-19)	206	77	309	**727**
Southern and Eastern	Medium (20-99)	65	0	43	
Southern and Eastern	Large (100 or more)	12	0	7	
Southern and Eastern	Medium and Large (20+)	0	10	0	
		835	**454**	**1784**	**3073**

Table 9: Median Universe Estimates

		Manufacturing	Retail	Other Services	Grand Total
Kigali	Small (5-19)	202	210	816	**1,485**
Kigali	Medium (20-99)	51	28	124	
Kigali	Large (100 or more)	17	5	32	
Western and Northern	Small (5-19)	148	39	211	**493**
Western and Northern	Medium (20-99)	32	9	36	
Western and Northern	Large (100 or more)	10	2	5	
Southern and Eastern	Small (5-19)	167	59	256	**598**
Southern and Eastern	Medium (20-99)	53	0	35	
Southern and Eastern	Large (100 or more)	11	0	7	
Southern and Eastern	Medium and Large (20+)	0	10	0	
		691	**363**	**1523**	**2576**

Table 10: Strict Universe Estimates

		Manufacturing	Retail	Other Services	Grand Total
Kigali	Small (5-19)	192	191	796	**1,429**
Kigali	Medium (20-99)	49	26	122	
Kigali	Large (100 or more)	16	5	33	
Western and Northern	Small (5-19)	133	34	195	**449**
Western and Northern	Medium (20-99)	30	8	34	
Western and Northern	Large (100 or more)	10	2	4	
Southern and Eastern	Small (5-19)	146	49	231	**531**
Southern and Eastern	Medium (20-99)	47	0	32	
Southern and Eastern	Large (100 or more)	10	0	6	
Southern and Eastern	Medium and Large (20+)	0	10	0	
		632	**325**	**1452**	**2410**

Table 11: Item Response Rates

	Screener/Interview	d2	l1	n2a	all TFP variables
Panel	Fresh	100.0%	99.6%	98.4%	77.8%
	Panel	100.0%	100.0%	95.7%	78.8%
Size	Small (5-19)	100.0%	99.4%	95.5%	67.5%
	Medium (20-99)	100.0%	100.0%	99.3%	76.8%
	Large (100+)	100.0%	100.0%	98.4%	91.7%
Region	Kigali	100.0%	99.2%	97.7%	83.8%
	Western and Northern	100.0%	100.0%	99.1%	70.2%
	Southern and Eastern	100.0%	100.0%	95.7%	81.3%
Sector	Manufacturing	100.0%	100.0%	99.2%	78.0%
	Other Services	100.0%	99.3%	97.4%	N/A
	Retail	100.0%	100.0%	94.7%	N/A
Overall	Rwanda 2023	100.0%	99.7%	97.5%	78.0%

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).