

## **Enterprise Survey (Productivity and Investment Climate Survey) in Zambia Sample Survey Design**

### **1. Survey coverage**

The World Bank Enterprise Survey in Zambia targeted establishments located in Lusaka, Kitwe, Ndola and Livingstone in the following industries (according to ISIC, revision 3.1): all manufacturing sectors (group D), construction (group F), retail and wholesale services (sub-groups 52 and 51 of group G), hotels and restaurants (group H), transport, storage, and communications (group I), and computer and related activities (sub-group 72 of group K). For establishments with five or more full-time permanent paid employees, this universe was stratified according to the following categories of industry:

1. Manufacturing: Food;
2. Manufacturing: Garment;
3. Manufacturing: Printing;
4. Manufacturing: Metal;
5. Retail Trade;
6. Rest of the universe, including:
  - Other Manufacturing activities
  - Construction;
  - Wholesale trade;
  - Hotels, bars and restaurants;
  - Transportation, storage and communications;
  - Computer related activities.

The survey also sampled a selection of micro establishments (establishments with less than five full-time permanent paid employees) from the targeted universe, without stratification by industry.

### **2. Sampling methodology**

#### **Establishments with five or more full-time paid permanent employees**

The sample was drawn from a Master list obtained by compiling two different updates of a list of establishments provided by CSO (Central Statistical Office). At first, another source was taken into account: a list of TPIN establishments (Tax Payer Identification Number). This list was discarded once in the field. The randomly selected group of 80 establishments drawn to validate the list turned out to be composed of 60% of non-existent or closed establishments. Also it only contained names of entities that apparently pay taxes. This excludes companies exempt from paying taxes as their earnings are

- too small,
- very large companies that are given special tax exemptions, and
- all companies that are not formally registered, and not only micros.

During the survey period, the master list was updated as new information regarding establishments that had closed or were out-of-scope was gathered and other establishments were added. The final population size in all strata and locations was 3336.

In Zambia, the survey included panel data collected from establishments surveyed in 2003. That survey included establishments in all four manufacturing strata distributed across the entire country. In order to collect the largest possible set of panel data, an attempt was made to contact and survey every establishment in the panel, provided it was located in one of the four cities covered by this survey, it operated in the universe under study, and that the number of panel firms of a certain size in a given industry in a given city did not exceed the number of establishments in the corresponding sample structure.

The remainder of the sample (including the entire rest of universe and retail sample in each city) was selected at random from the master list by a computer program.

### **Micro-establishments**

In this survey, the micro establishment stratum covers all establishments with less than 5 permanent employees. For many reasons including the small size of establishments, their expected high rate of turnovers, the high level of “informality” of establishments in many activities and consequently the difficulty to obtain trustworthy information from official sources, EEC Canada selected an aerial sampling approach to estimate the population of establishments and select the sample in this stratum for all regions of the survey.

First, to randomly select individual micro establishments for surveying, the following procedure was followed:

- i) Select *districts and specific zones* of each district where there was a high concentration of micro establishments. The districts and the specific zones were first selected according to our national sources.

For example, the following districts were selected in Lusaka:

Districts of Lusaka	Estimated number of micro establishments
Soweto Market	8880
Kamala Market	4651
City Center Market	527

- ii) *Count all micro establishments* in these specific zones and then per city. Here are the results for Zambia;

City	Estimated number of micro establishments
Lusaka	6058
Kitwe	6432
Ndola	5970
Livingstone	3359

- iii) Based on this count, create a virtual list and select establishments at random from that virtual list; and
- iv) based on the ratio between the number selected in each specific zone and the total population in that zone, create and apply a skip rule for selecting establishments in that zone.

At head office the following procedure was followed: The count by zone was converted into one list of sequential numbers for the whole survey region, and a computer program performed a random selection of the determined number of establishments from the list. The resulting sample was sent back to the EEC field team.

In Zambia, enumerators were sent to each zone with instructions as to how to apply the skip rule defined for that zone as well as how to select replacements in the event of a refusal or other cause of non-participation.

### 3. Population and sample size

**Table 1**  
**Population size by stratum and sampling region**

City	Size	Food	Garment	Printing	Metal	Retail	Residual services	Residual Manufacturing	Total residual	Total non-micro
LUSAKA	small	75	55	39	15	521	482	95	577	1282
	medium	53	6	23	16	244	332	107	439	781
	large	39	1	6	3	77	137	50	187	313
<b>LUSAKA Total</b>		167	62	68	34	842	951	252	1203	2376
KITWE	small	8	4	3	12	124	86	28	114	265
	medium	11	0	4	13	44	59	24	83	155
	large	9	0	0	3	7	32	13	45	64
<b>KITWE Total</b>		28	4	7	28	175	177	65	242	484
NDOLA	small	8	0	5	2	68	48	15	63	146
	medium	6	5	4	11	25	59	30	89	140
	large	6	1	2	0	7	25	21	46	62
<b>NDOLA Total</b>		20	6	11	13	100	132	66	198	348
LIVINGSTONE	small	9	7	3	1	25	23	3	26	71
	medium	5	2	0	0	12	25	3	28	47
	large	0	0	0	0	1	7	2	9	10
<b>LIVINGSTONE Total</b>		14	9	3	1	38	55	8	63	128
Zambia	small	100	66	50	30	738	639	141	780	1764
	medium	75	13	31	40	325	475	164	639	1123
	large	54	2	8	6	92	201	86	287	449
<b>Grand Total</b>		229	81	89	76	1155	1315	391	1706	3336

**Table 2**  
**Sample size by stratum and sampling region**

City	Size	Food	Garment	Printing	Metal	Retail	Residual	Total non-micro	Micro	Total
LUSAKA	small	30	35	19	1	63	29	177		
	medium	26	5	10	5	10	28	84		
	large	19	1	5	1	3	11	40		
<b>LUSAKA Total</b>		75	41	34	7	76	68	301	82	383
KITWE	small	4	2	1	3	13	5	28		
	medium	6	0	1	10	2	9	28		
	large	2	0	0	3	0	5	10		
<b>KITWE Total</b>		12	2	2	16	15	19	66	15	81
NDOLA	small	7	0	2	0	9	4	22		
	medium	3	5	0	2	2	18	30		
	large	5	1	0	0	0	6	12		
<b>NDOLA Total</b>		15	6	2	2	11	28	64	13	77
LIVINGSTONE	small	9	7	3	1	14	9	43		
	medium	3	0	0	0	0	4	7		
	large	0	0	0	0	0	3	3		
<b>LIVINGSTONE Total</b>		12	7	3	1	14	16	53	9	62
Zambia	small	50	44	25	5	99	47	270		
	medium	38	10	11	17	14	59	149		
	large	26	2	5	4	3	25	65		
<b>Grand Total</b>		114	56	41	26	116	131	484	119	603

4. Participation

Table 3  
Refusals as a percentage of the population by stratum and sampling region

City	Size	Food	Garment	Printing	Metal	Retail	Residual	Total non-micro
LUSAKA	small	12%	36%	5%	20%	1%	1%	4%
	medium	13%	17%	17%	19%	3%	1%	4%
	large	21%	0%	17%	67%	31%	5%	14%
LUSAKA Total		14%	34%	10%	24%	4%	2%	5%
KITWE	small	50%	50%	67%	17%	7%	3%	8%
	medium	36%		75%	23%	11%	6%	13%
	large	67%			0%	100%	13%	30%
KITWE Total		50%	50%	71%	18%	12%	6%	13%
NDOLA	small	13%		60%	100%	6%	3%	8%
	medium	50%	0%	100%	18%	16%	3%	11%
	large	17%	0%	100%		43%	2%	11%
NDOLA Total		25%	0%	82%	31%	11%	3%	10%
LIVINGSTONE	small	0%	0%	0%	0%	24%	4%	10%
	medium	40%	100%			75%	4%	30%
	large					100%	22%	30%
LIVINGSTONE Total		14%	22%	0%	0%	42%	6%	19%
Zambia	small	14%	33%	14%	23%	3%	2%	5%
	medium	21%	23%	35%	20%	8%	2%	7%
	large	28%	0%	38%	33%	38%	6%	16%
Grand Total		20%	31%	24%	22%	7%	3%	7%

5. Sample weights

Table 4  
Sample weights by stratum and sampling region

City	Size	Food	Garment	Printing	Metal	Retail	Residual	Total non-micro
LUSAKA	small	2.50	1.57	2.05	15.00	8.27	19.90	7.24
	medium	2.04	1.20	2.30	3.20	24.40	15.68	9.30
	large	2.05	1.00	1.20	3.00	25.67	17.00	7.83
LUSAKA Total		2.23	1.51	2.00	4.86	11.08	17.69	7.89
KITWE	small	2.00	2.00	3.00	4.00	9.54	22.80	9.46
	medium	1.83		4.00	1.30	22.00	9.22	5.54
	large	4.50			1.00		9.00	6.40
KITWE Total		2.33	2.00	3.50	1.75	11.67	12.74	7.33
NDOLA	small	1.14		2.50		7.56	15.75	6.64
	medium	2.00	1.00		5.50	12.50	4.94	4.67
	large	1.20	1.00				7.67	5.17
NDOLA Total		1.33	1.00	5.50	6.50	9.09	7.07	5.44
LIVINGSTONE	small	1.00	1.00	1.00	1.00	1.79	2.89	1.65
	medium	1.67					7.00	6.71
	large						3.00	3.33
LIVINGSTONE Total		1.17	1.29	1.00	1.00	2.71	3.94	2.42
Zambia	small	2.00	1.50	2.00	6.00	7.45	16.60	6.53
	medium	1.97	1.30	2.82	2.35	23.21	10.83	7.54
	large	2.08	1.00	1.60	1.50	30.67	11.48	6.91
Grand Total		2.01	1.45	2.17	2.92	9.96	13.02	6.89

6. Panel data

Table 7  
Panel Sample (based on size in 2003)

City	Food	Garment	Printing	Retail	Residual	Fab Metal	Out of scope	Panel Total
LUSAKA	19	3	9	4	33	4	25	72
KITWE	7				14	12	5	33
NDOLA	4	4			15	4	4	27
LIVINGSTONE	1		1	1	1	0	1	4
Grand Total	31	7	10	5	63	20	35	136

Table 8  
Panels Surveyed

City	SIZE	Food	Garment	Printing	Retail	Residual	Metal	Panel Total
LUSAKA	small	0		2		1		3
	medium	6	2	1	2	9	3	23
	large	7	1	2	1	6		17
LUSAKA Total		13	3	5	3	16	3	43
KITWE	small					1	1	2
	medium	4				5	7	16
	large	1				4	1	6
KITWE Total		5			0	10	9	24
NDOLA	small					1		1
	medium	1	3			5	1	10
	large	2				4		6
NDOLA Total		3	3		0	10	1	17
LIVINGSTONE	small			1				1
	medium	1						1
	large					1		1
LIVINGSTONE Total		1	0	1	0	1	0	3
Grand Total		22	6	6	3	37	13	87

Table 9  
Panels approached, refused, unavailable, and surveyed by stratum and sampling region

Status	LUSAKA	KITWE	NDOLA	LIVINGSTONE	Grand Total
Panel population	72	33	27	4	136
Closed / Disappeared	7	5	4	1	17
Less than 5 employees		4			4
Revised population	65	24	23	3	115
Completed	43	24	17	3	87
Refusal to participate	22	0	6		28
Revised completion	66%	100%	74%	100%	76%