Liberia Indicator Survey Data Set

1. Introduction

This document provides additional information on the data collected in Liberia from 15 September 2008 to 13 February 2009 as part of the Indicator Survey, an initiative of the World Bank.

The objective of the Indicator Surveys is to obtain feedback from enterprises in client countries on the state of the private sector as well as to build a panel of enterprise data that will make it possible to track changes in the business environment over time and allow, for example, impact assessments of reforms.

Through interviews with firms in the manufacturing and services sectors, the Indicator Survey data provides information on the constraints to private sector growth and is used to create statistically significant business environment indicators that are comparable across countries.

The report describes the sampling design of the survey, the structure of the dataset and additional information that may be useful when using the data, including information on non-response rates, the calculation of sample weights and country-specific factors that may have affected survey implementation.

2. Survey Target Population

The whole population, or the universe, covered in the Indicator Surveys is the non-agricultural economy. It comprises: all manufacturing sectors according to the ISIC Revision 3.1 group classification (group D), construction sector (group F), services sector (groups G and H), and transport, storage, and communications sector (group I). Note that this population definition excludes the following sectors: financial intermediation (group J), real estate and renting activities (group K, except sub-sector 72, IT, which was added to the population under study), and all public or utilities-sectors.

For Liberia, the sectors included in the sample by two-digit ISIC code are as follows:

Manufactures: 10, 14, 16, 20, 22, 24, 31, 32, 33, 41, 45, 46, 47, 94,96

Services: 55, 56, 41, 43, 63, 52, 49, 51, 53, 58, 50, 47,14, 46, 45, 51, 56, 85

Sample selection was carried out by the TNS opinion – UK using the frame. To reduce non-response bias the sample was drawn in matched replicates so that each sampled establishment had at least one matched substitute (where available) in the event of non-contact or refusal.

In the Indicator Surveys, the requirements for registration are defined on a country-by-country basis using the information collected by Doing Business and information from the in-country contractors. In Liberia, registered firms were defined as firms that had a Tax Identification Card (carte d'identification fiscale).

3. Sampling for Registered Establishments

The sample for registered establishments in Liberia was selected using stratified random sampling, following the methodology explained in the *Sampling Manual*.[1] As discussed in greater detail in the *Sampling Manual*, stratified random sampling was preferred over simple random sampling in the Indicator Surveys for several reasons:[2,3]

a. To obtain unbiased estimates for different subpopulations within the economy with some known level of precision.

b. To obtain unbiased estimates for the whole population.

c. To ensure that the final sample includes establishments from all relevant sectors in the country and that it is not concentrated in one or two of industries/sizes/regions.

d. To exploit the benefits of stratified sampling where population estimates, in many cases, will be more precise than using a simple random sampling method (i.e., lower standard errors, other things being equal.)

e. Stratification may also produce a smaller bound on the estimation errors than would be produced by a simple random sample of the same size. This result is particularly true if measurements within strata are homogeneous.

f. The cost per observation of collecting the survey data may be reduced by stratifying the population elements into convenient groupings.

Three levels of stratification were used in the Liberia sample: firm sector, firm size, and geographic region.

Industry stratification was designed as follows: the universe was stratified into one manufacturing industry and one services industry (retail).

Size stratification was defined following the standardized definition used for the Indicator Surveys: small (5 to 19 employees), medium (20 to 99 employees), and large (more than 99 employees). For stratification purposes, the number of employees was defined on the basis of reported permanent full-time workers.

Regional stratification was defined in terms of the geographic regions with the largest commercial presence in the country: Montserrado, Nimba, and Margibi.

4. Sampling implementation

Given the stratified design, sample frames containing a complete and updated list of establishments as well as information on all stratification variables (number of employees, industry, and region) are required to draw the sample for the Indicator Surveys.

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[1] The complete text of the *Sampling Manual* can be found at http://www.enterprisesurveys.org/documents/Implementation_note.pdf

[2] A stratified random sample is one obtained by separating the population elements into non-overlapping groups, called strata, and then selecting a simple random sample from each stratum. (Richard L. Scheaffer; Mendenhall, W.; Lyman, R., "Elementary Survey Sampling", Fifth Edition).

[3] See Cochran, W., 1977, pp. 89; Lohr, Sharon, 1999, pp. 95.

It was possible to obtain a single usable frame for Liberia. The frame acquired for Liberia was from its Central Bureau of Statistics and used data obtained from the 2007 Establishment Census [2007 NEC]. This census was conducted by LISGIS.

Universe Figures for Liberia

Sources: Central Bureau of Statistics – 2007 National Establishment Census

Region	Employees	Sector		
		Manufacturing	Services	Grand Total
Montserrado	5-19	387	1,079	1,466
	20-99	43	104	147
	100+	5	6	11
Montserrado Total		435	1,189	1,624
Nimba	5-19	16	78	94
	20-99		1	1
	100+			
Nimba Total		16	79	95
Margibi	5-19	28	93	121
	20-99	1	3	4
	100+			
Margibi Total		29	96	125
Grand Total		480	1,364	1,844

The quality of the frame was assessed at the onset of the project and was not immune from 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, adjustments may be needed when computing the appropriate weights for individual observations. The percentage of confirmed non-eligible units as a proportion of the total number of sampled establishments contacted for the survey was 1.37% (5 out of 364 establishments for the sample).[4]

5. Database Structure

Only one questionnaire – the Indicator Questionnaire – was used for all sectors.

All variables in the database are named using, first, the letter of each section and, second, the number of the variable within the section, i.e. *a1* denotes section *A*, question *1*. Variable names preceded by a prefix "*AF"* indicate questions specific to the Africa region; these questions may not have been asked in Indicator Surveys conducted in countries in other regions. All other variables are global and are present in all country surveys conducted throughout the world. All

[4] Appendix B shows the tabulations for the Liberia sample of registered firms of response codes that are classified as eligible and non-eligible.

variables are numeric with the exception of those variables with an "x" at the end of their names. The suffix "x" indicates that the variable is alpha-numeric.

The variable *idstd* uniquely identifies each establishment at the global level.

The variables *a2* (sampling region), *a6a* (sampling establishment's size), and *a4a* (sampling sector) contain the establishment's classification into the strata chosen for each country using information from the sample frame. These variables generate the strata cells for each industry/region/size combination. The variables containing the sample frame information are included in the data set for researchers who may want to further investigate statistical features of the survey and the effect of the survey design on their results.

-*a2* is the variable describing the sampling regions

-*a6a*: coded using the definition for micro, small, medium, and large establishments as discussed above. The code -*9* was used to indicate units for which size was undetermined in the sample frame.

-*a4a*: coded using ISIC codes for the industries that comprise the manufacturing, services, and residual categories used in the stratification. These codes include most manufacturing industries (15 to 37), and retail, and IT for services (52, and 72 respectively). All establishments within the 'other manufacturing' stratum were coded with a4a=2.

-id: each firm is given a unique ID number at the country level

Note that these variables may not coincide with reality for some establishments as sample frames may contain information that is later found to be inaccurate.

The surveys were implemented following a two stage procedure. In the first stage a screener questionnaire was administered over the phone to determine sampled establishment's eligibility for the survey and to make appointments; in the second stage, a face-to-face interview took place with the Manager/Owner/Director of each establishment. The variables *a4b* and *a6b* contain the industry and size of the establishment from the screener questionnaire. Variables *a8* to *a11* contain additional information that was collected in the screening phase.

The main questionnaire contains variables for location (*a3x*), industry (*d1a2*), and number of employees (*l1*, *l6* and *l8*) that more accurately reflect describe the characteristics of establishments than the information provided on these variables in the sample frame or the screener.

A distinction should be made between the variable *a4a* and *d1a2 (industry expressed as ISIC rev. 3.1 code)*. The former gives the establishment's classification into industry-strata based on information available from the sample frame, whereas variable *d1a2* indicates the actual ISIC code of the main output of the establishment as answered by the interviewee. This variable is probably the most accurate variable with which to classify establishments by activity.

Variable *a3x* indicates the actual location of the establishment. There may be divergences between the location in the sampling frame and the actual location, as establishments may be listed in one place on the sample frame but the actual physical location is in another place.

Variables *l1*, *l6* and *l8* provide a more accurate measure of employment and account for both permanent and temporary employment. Special efforts were made to make sure that this information was not missing for most establishments.

6. Universe Estimates

Special care is given to the correct computation of universe estimates and weights in the Indicator Surveys. Considering the varying quality of sample frames across countries, it is important to accurately adjust the universe totals within each region/industry/size stratum to account for the presence of ineligible units in the sampling frame.[5] The information collected during the screening process is used to scale down the universe estimate for each cell by the observed proportion of ineligible units within the cell.

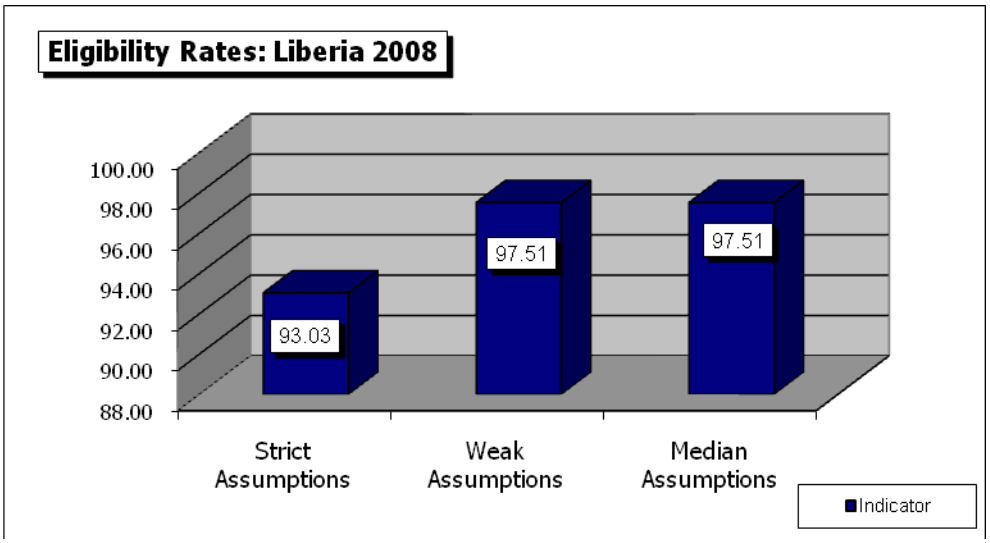
Of course, different assumptions about the eligibility of establishments result in different adjustments to the universe cells and thus different sampling weights. For some establishments where contact was not successfully completed during the screening process it is not possible to directly determine eligibility. Three sets of assumptions on establishment eligibility are considered:

a- Strict assumption: eligible establishments are only those for which it was possible to directly determine eligibility. The resulting weights are included in the variable *w_strict*.

b- Median assumption: eligible establishments are those for which it was possible to directly determine eligibility and those that rejected the screener questionnaire or an answering machine or fax was the only response. The resulting weights are included in the variable *w_median*.

c- Weak assumption: in addition to the establishments included in points a and b, all establishments for which it was not possible to contact or that refused the screening questionnaire are assumed eligible. This definition includes as eligible establishments with dead or out of service phone lines, establishments that never answered the phone, and establishments with incorrect addresses for which it was impossible to find a new address. The resulting weights are included in the variable *w_weak*. Under the weak assumption only observed non-eligible units are excluded from universe projections. The following graph shows the different eligibility rates under each set of assumptions.

[5] For example, ineligible units could include: firms that discontinued businesses, education or government establishments, establishments with less than 5 employees in the ES sample, establishments where there was no reply after having called in different days of the week and in different business hours, the number was out of order, no tone in the phone line, answering machine, fax line, wrong address or moved away and could not obtain new contact information.



7. Weights

Since the sampling design was stratified and employed differential sampling of the strata, individual observations should be properly weighted when making inferences about the population. Under stratified random sampling unweighted estimates are biased unless sample sizes are proportional to the size of each stratum. With stratification the probability of selection of each unit is, in general, not the same. Consequently, individual observations must be weighted by the inverse of their probability of selection (probability weights or *pw* in Stata.)[6]

Two sets of weights for each cell were computed using the strict, weak, and median assumptions on establishment eligibility. The first set of estimates calculated proportions using the raw sample count for each cell. However, for many cells the sample numbers of interviewed establishments are small, and eligibility rates and adjusted universe cells projections for those cells are subject to relatively large sampling variations. Therefore a second set of more robust estimates (collapsed weights) that use the multiples of the relative eligibility rates for each industry, size, and region was also produced. The collapsed weights are based on larger samples than the individual cells and thus produce values with smaller sampling variations. The data sets include only the robust weights.

Appendix D shows the cell weights for registered establishments in Liberia.

8. Appropriate use of weights

As discussed above, under stratified random sampling weights should be used when making inferences about the population. Any estimate or indicator that aims at describing some feature of the population should take into account that individual observations may not represent equal shares of the population.

[6] This is equivalent to the weighted average of the estimates for each stratum, with weights equal to the population shares of each stratum.

However, there is some discussion on the proper use of weights in regressions (see Deaton, 1997, pp.67; Lohr, 1999, chapter 11, Cochran, 1953, pp.150). There is not strong large sample econometric argument in favor of using weighted estimation for a common population coefficient if the underlying model varies per stratum (stratum-specific coefficient): both simple OLS and weighted OLS are inconsistent under regular conditions. However, weighted OLS has the advantage of providing an estimate that is independent of the sample design. This latter point may be quite relevant for the Indicator Surveys as in most cases the objective is not only to obtain model-unbiased estimates but also design-unbiased estimates (see also Cochran, 1977, pp 200 who favors the used of weighted OLS for a common population coefficient).

From a more general approach, if the regressions are descriptive of the population then weights should be used. The estimated model can be thought of as the relationship that would be expected if the whole population were observed.[7] If the models are developed as structural relationships or behavioral models that may vary for different parts of the population, there is no reason to use weights.

9. Non-response

The Indicator Surveys, along with all other surveys, suffer from both survey non-response and item non-response. The former refers to refusals to participate in the survey altogether whereas the latter refers to the refusals to answer some specific questions. Different strategies were used to address these issues.

Survey non-response was addressed by maximizing efforts to contact establishments that were initially sampled. When the survey frame was extracted from the sampling frame, several establishments with the same strata characteristics were randomly selected for each interview and each establishment was assigned a preference number.[8] Substitutions of replacement establishments were made in order to help achieve targets on the number of interviews for each stratum. Extensive efforts were made to complete interviews with each first preference establishment before contact with a replacement establishment was allowed. At least four attempts were made to contact each sampled establishment for an interview at different times/days of the week before a replacement establishment was allowed to be contacted for an interview.

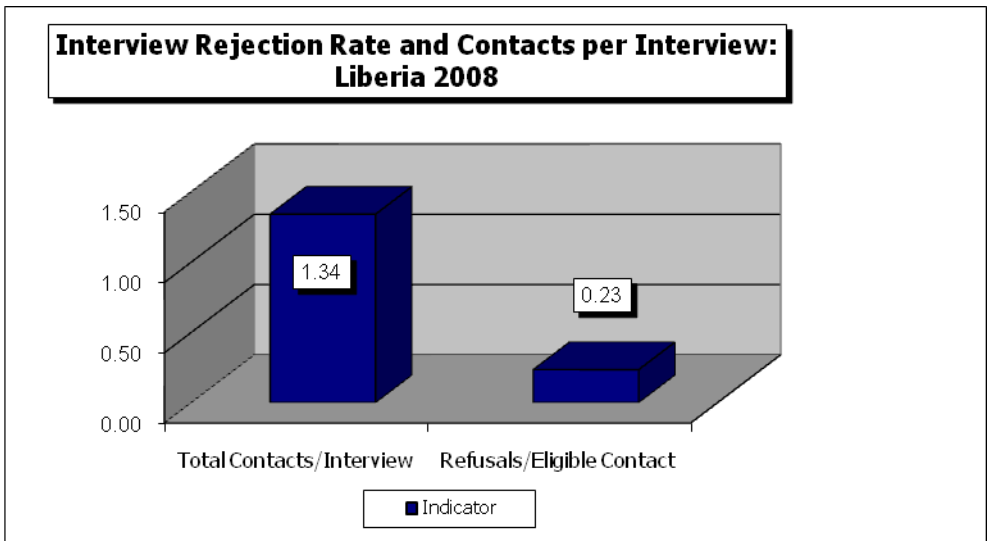
Further research is needed on survey non-response in the Indicator Surveys regarding the potential introduction of bias through substitution and non-response.

As the following graph shows, the number of contacted establishments per realized interview was 1.34. This number is the result of two factors: explicit refusals to participate in the survey, as

[7] The use weights in most model-assisted estimations using survey data is strongly recommended by the statisticians specialized on survey methodology of the JPSM of the University of Michigan and the University of Maryland.

[8] In cases where the number of contacts initially drawn from the sample frame are insufficient to obtain an interview with the targeted number of establishments in a given strata, additional contacts for that strata may be drawn from the sampling frame. If all establishments in that strata have already been contacted and the sample target has not been reached, the sample design may be adjusted to allow additional interviews in other strata.

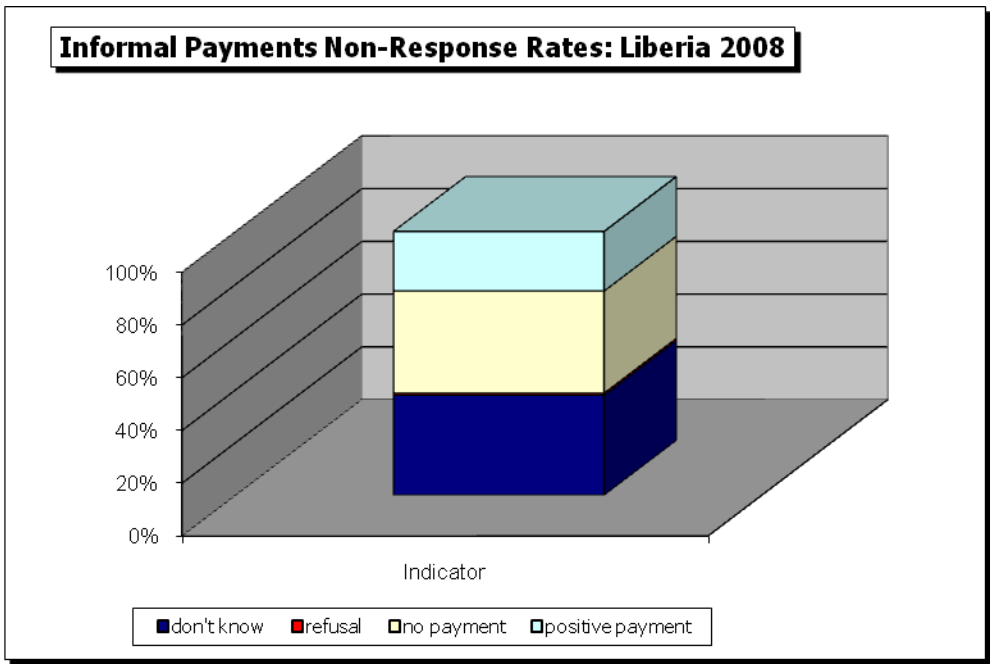
reflected by the rate of rejection (which includes rejections of the screener and the main survey) and the quality of the sample frame, as represented by the presence of ineligible units (e.g., establishments that closed or were in ineligible sectors). Refusal rates are also shown in the graph below. For each establishment eligible for an interview, 0.23 refused to participate.



In completed surveys, item non-response was addressed by two strategies:

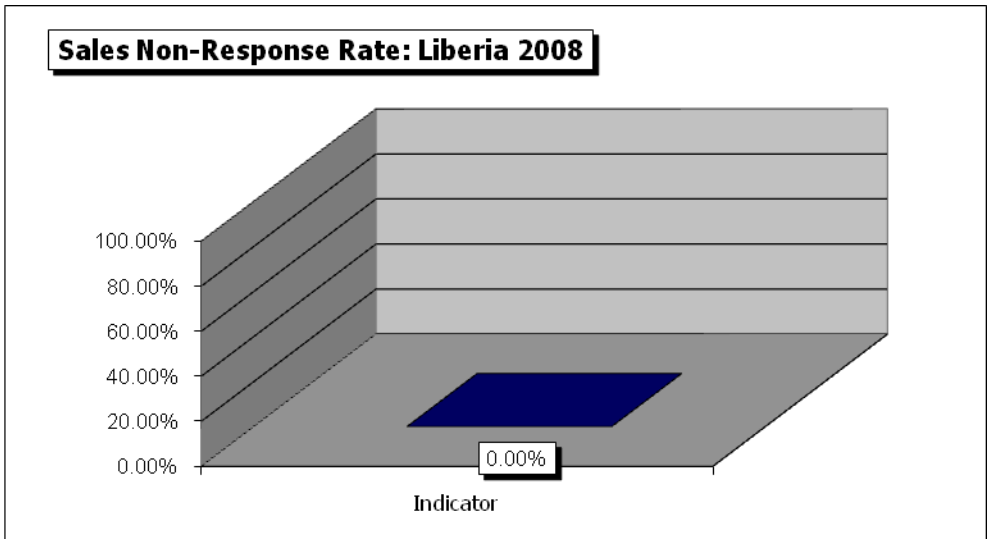
a- For sensitive questions that may generate negative reactions from the respondent, such as corruption or tax evasion, enumerators were instructed to collect the refusal to respond (-7) as a different option from don't know (-9).

The following graph shows the breakdown of answers about the total amount of informal payments made annually (variable *j7b*) by questionnaire type.



b- Establishments with incomplete information on important questions including total sales, cost figures and employment levels were re-contacted in order to complete this information. However, re-contacts did not fully eliminate low response rates for some items.

The following graph shows non-response rates for the sales variable, *d2*, by type of questionnaire.[9]



This report summarizes statistics on rejection rates, eligibility rates, and item non-response to alert researchers of these issues when using the data and when making inferences. Item non-

[9] Please note that the question on total sales does not have a "refuse to answer" option, thus the non-response rates in the graph above reflect DKs and NAs as well as any missing values.

response, selection bias, and imperfect sampling frames are not unique to Liberia or the Indicator Surveys. All surveys suffer from these issues although they may not be made explicit.

10. Country specific comments

Local Agency team involved in the study:

Local Agency	Name: Liberia Institute For Statistics And Geo-Information Services Country: Liberia
Name of Project Manager	Kormay Adams- Lead Consultant
Name and position of other key persons of the project:	Boima Sonii- Field Coordinator Francois David- Field Coordinator
Enumerators involved:	Enumerators: 10 The Enumerators did face to face recruitment as the landlines network is very poor
Other staff involved:	Fieldwork Coordinators : 2 Editing: The 2 coordinators also did the editing Data Entry:2

Comments on sample frame:

Characteristic of sample frame used:	The sample frame received from LISGIS contains: - Name - Location - Telephone Number - Serial Number-with region, district and chiefdom codes - Main activity - Principal products (goods and/or services) - Industrial classification (ISIC codes) and description - Persons engaged
Source:	The sample frame was the Establishment Census, which was conducted by LISGIS in 2007.
Year:	2007 Liberia Institute For Statistics And Geo-Information Services (LISGIS) conducted the last economic census
Comments on the quality of sample frame:	The list being very recent, over 95% of the establishments were accessible.
Other sources for companies' statistics	None

Comments on sample:

Comments/ problems on sectors	On sectors: None

and regions selected in the sample:	On regions: None
Comments on the response rate:	There was a high response rate especially as a result of positive attitude towards the international community in collaboration with the government in their reconstruction efforts after a period of civil strife. There was also very positive attitude towards World Bank initiatives.

Comments on Fieldwork:

Date of Fieldwork	2 July through 25 July 2008
Country	Liberia
Interview number	Manufactures: 81 Services: 69
Problems found during fieldwork:	- Training and acquiring the Sample frame from LISGIS was delayed for a week due to slow response from the local World Bank office to certify the legitimacy of the survey - The was also a lapse period between training and actual data collection (one month) due to delay selection of the sample establishment from the sample frame - Interviewers rush to complete interviews resulted cases of some going to preference 2 or three before exhausting trials to get preference 1 interviews; and had to be sent back to field to try and get the Preference 1 interviews
Other observations:	Working with a lead consultant from the LISGIS and the World Bank gave the survey an added advantage in securing interviews.

Questionnaires:

Problems for the understanding of questions (write question number)	*These were noted during the pilot and appropriate action taken.* **F1 & AFJ8**: These questions have a higher level of difficulty. The trainers should make the enumerators to understand their meaning fully by giving examples **B2 & B3**: Emphasize on the enumerators that they are completely unrelated as far as the 100% are concerned. Some enumerators came from the field with B2 and B3 summing up to 100%
Problems found in the	None

navigability of questionnaires (for example, skip patterns).	
Comments on questionnaire length:	Taking above 1 hour of top executive time is always a challenge and numerous rescheduling and interruptions were experienced.
Suggestions or other comments on the questionnaire:	However the possibility of using more than one respondent (eg. Managing director and Finance manager/or personnel manager) helped to lessen the negative effect. In very large organization (over 99 employees), the possibility of using the three staff to effectively/comprehensively cover Administration, personnel and finance should be explored.

Database:

Comments on the data entry program:	Data entry program chosen: CATI Perts version D2.52 Comments: Very user friendly but should be sent during the training phase of fieldwork to ensure familiarity with local suppliers and quick turn sounds of data entry.
Comments on the data cleaning:	Due to the comments above, we had to create an Excel worksheet to check data validity during fieldwork which led to rework (double DE) and delay in DE and getting validation reports. This also resulted in difficulties in verification of data caused by long lapses between the period of interviewing and call backs.

Country situation:

General aspects of economic, political or social situation of the country that could affect the results of the survey:	The economy is freshly out from political unrest and very few establishments are operating formally audited financial accounting.

References

Cochran, William G., Sampling Techniques, 1977.

Deaton, Angus, The Analysis of Household Surveys, 1998.

Levy, Paul S. and Stanley Lemeshow, Sampling of Populations: Methods and Applications, 1999.

Lohr, Sharon L. Samping: Design and Techniques, 1999.

Scheaffer, Richard L.; Mendenhall, W.; Lyman, R., Elementary Survey Sampling, Fifth Edition, 1996

Appendix A

Original Sample Design

Sample selection was carried out by the TNS opinion – UK *using the frame. To reduce non-response bias the sample was drawn in matched replicates so that each sampled establishment had at least one matched substitute (where available) in the event of non-contact or refusal.*

Completed interviews - Liberia

Region	Employees	Sector		Grand Total
		Manufacturing	Services	
Montserrado	5-19	22	25	47
	20-99	22	20	42
	100+	5	4	9
Montserrado Total		49	49	98
Nimba	5-19	10	8	18
	20-99		1	1
	100+			
Nimba Total		10	9	19
Margibi	5-19	21	10	31
	20-99	1	1	2
	100+			
Margibi Total		22	11	33
Grand Total		81	69	150

Appendix B

Indicator Survey Sample

Status Codes

	ELIGIBLES	
Eligible	1.Eligible establishment *(Correct name and address)*	182
	2. Eligible establishment *(Different name but same address - the new firm/establishment bought the original firm/establishment)*	1
	3. Eligible establishment *(Different name but same address - the firm/establishment changed its name)*	0
	4. Eligible establishment *(Wrong address - the firm/establishment has changed address and the address could be found)*	4
	16. Panel firm - now less than five employees	0
Ineligible	5. The establishment has less than 5 permanent full time employees	0
	6. The firm discontinued businesses	3
	7. Not a business: private household	0
	8. Ineligible activity: education, agriculture, finances, governments…	2
Unobtainable	91. No reply *(after having called in different days of the week and in different business hours)*	0
	92. Line out of order	0
	93. No tone	0
	10. Answering machine	0
	11. Fax line - data line	0
	12. Wrong address/ moved away and could not get the new references	0
	13. Refuses to answer the screener	9
	14. In process *(the establishment is being called/ is being contacted - previous to ask the screener)*	**0**
	151. Out of target - outside the covered regions, firm moved abroad	0
	152. Out of target - firm moved abroad	0
	Total	**201**

Eligibility criteria

Strict eligibility	= (Sum of the numbers with codes 1, 2, 3, 4 & 16)/Total
Weak eligibility	= (Sum of the numbers with codes 1, 2, 3, 4, 16, 91, 92, 93, 10, 11, 12, & 13)/Total
Median eligibility	= (Sum of the numbers with codes 1, 2, 3, 4, 16, 10, 11, 13)/Total

Response Outcomes

Complete interviews *(Total)*	150
Incomplete interviews	0
Eligible in process	0
Refusals	37
Out of target	5
Impossible to contact	0
Ineligible - coop.	0
Refusal to the Screener	9
Total	**201**

Appendix C

Universe Estimates, Liberia:

Strict Universe estimates

Individual Cells

Region	Employees	Sector		Grand Total
		Manufacturing	Services	
Montserrado	5-19	352	1,002	1,354
	20-99	40	99	139
	100+	5	6	11
Montserrado Total		397	1,106	1,503
Nimba	5-19	15	74	89
	20-99		1	1
	100+			
Nimba Total		15	75	90
Margibi	5-19	25	86	111
	20-99	1	3	4
	100+			
Margibi Total		26	89	115
Grand Total		438	1,270	1,708

Collapsed Cells

Region	Employees	Sector		Grand Total
		Manufacturing	Services	
Montserrado	5-19	352	676	1,027
	20-99	40	99	139
	100+	5	6	11
Montserrado Total		397	780	1,177
Nimba	5-19	15	216	231
	20-99		1	1
	100+			
Nimba Total		15	217	232
Margibi	5-19	25	270	296
	20-99	1	3	4
	100+			
Margibi Total		26	273	299
Grand Total		438	1,270	1,709

Weak Universe estimates

Individual Cells

Region	Employees	Sector		Grand Total
		Manufacturing	Services	
Montserrado	5-19	387	1,067	1,453
	20-99	43	102	145
	100+	5	6	11
Montserrado Total		434	1,175	1,609
Nimba	5-19	15	74	89
	20-99		1	1
	100+			
Nimba Total		15	75	90
Margibi	5-19	26	86	112
	20-99	1	3	4
	100+			
Margibi Total		27	88	115
Grand Total		477	1,338	1,815

Collapsed Cells

Region	Employees	Sector		Grand Total
		Manufacturing	Services	
Montserrado	5-19	387	706	1,092
	20-99	43	102	145
	100+	5	6	11
Montserrado Total		434	814	1,248
Nimba	5-19	15	226	241
	20-99		1	1
	100+			
Nimba Total		15	227	242
Margibi	5-19	26	282	308
	20-99	1	3	4
	100+			
Margibi Total		27	285	312
Grand Total		477	1,326	1,802

Median Universe estimates

Individual Cells

Region	Employees	Sector		Grand Total
		Manufacturing	Services	
Montserrado	5-19	387	1,067	1,453
	20-99	43	102	145
	100+	5	6	11
Montserrado Total		434	1,175	1,609
Nimba	5-19	15	74	89
	20-99		1	1
	100+			
Nimba Total		15	75	90
Margibi	5-19	26	86	112
	20-99	1	3	4
	100+			
Margibi Total		27	88	115
Grand Total		477	1,338	1,815

Median Universe estimates

Collapsed Cells

Region	Employees	Sector		Grand Total
		Manufacturing	Services	
Montserrado	5-19	387	706	1,092
	20-99	43	102	145
	100+	5	6	11
Montserrado Total		434	814	1,248
Nimba	5-19	15	226	241
	20-99		1	1
	100+			
Nimba Total		15	227	242
Margibi	5-19	26	282	308
	20-99	1	3	4
	100+			
Margibi Total		27	285	312
Grand Total		477	1,326	1,802

Appendix D

Cell Weights Liberia:

Strict Cell weights

Individual Cell Weights

Region	Employees	Sector	
		Manufacturing	Services
Montserrado	5-19	16	40
	20-99	2	5
	100+	1	2
Nimba	5-19	1	9
	20-99		1
	100+		
Margibi	5-19	1	9
	20-99	1	3
	100+		

Collapsed Cell Weights

Region	Employees	Sector	
		Manufacturing	Services
Montserrado	5-19	16	27
	20-99	2	5
	100+	1	2
Nimba	5-19	1	27
	20-99		1
	100+		
Margibi	5-19	1	27
	20-99	1	3
	100+		

Weak Cell weights

Individual Cell Weights

Region	Employees	Sector	
		Manufacturing	Services
Montserrado	5-19	18	43
	20-99	2	5
	100+	1	2
Nimba	5-19	2	9
	20-99		1
	100+		
Margibi	5-19	1	9
	20-99	1	3
	100+		

Collapsed Cell Weights

Region	Employees	Sector	
		Manufacturing	Services
Montserrado	5-19	18	28
	20-99	2	5
	100+	1	2
Nimba	5-19	2	28
	20-99		1
	100+		
Margibi	5-19	1	28
	20-99	1	3
	100+		

Median Cell weights

Individual Cell Weights

Region	Employees	Sector	
		Manufacturing	Services
Montserrado	5-19	18	43
	20-99	2	5
	100+	1	2
Nimba	5-19	2	9
	20-99		1
	100+		
Margibi	5-19	1	9
	20-99	1	3
	100+		

Median Cell weights

Collapsed Cell Weights

Region	Employees	Sector	
		Manufacturing	Services
Montserrado	5-19	18	28
	20-99	2	5
	100+	1	2
Nimba	5-19	2	28
	20-99		1
	100+		
Margibi	5-19	1	28
	20-99	1	3
	100+		