The Uganda 2013 Enterprise Surveys Data Set

I. Introduction

1.   This document provides additional information on the data collected in Uganda between January 2013 and August 2013 as part of the Africa Enterprise Survey 2013, an initiative of the World Bank.

As part of its strategic goal of building a climate for investment, job creation, and sustainable growth, the World Bank has promoted improving business environments as a key strategy for development, which has led to a systematic effort in collecting enterprise data across countries. The Enterprise Surveys (ES) are an ongoing World Bank project in collecting both objective data based on firms' experiences and enterprises' perception of the environment in which they operate.

The Enterprise Surveys currently cover over 130,000 firms in 135 countries, of which 121 have been surveyed following the standard methodology. This allows for better comparisons across countries and across time. Data are used to create statistically significant business environment indicators that are comparable across countries. The Enterprise Surveys are also used 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.

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

II. Sampling Structure

2.   The sample for Uganda was selected using stratified random sampling, following the methodology explained in the *Sampling Manual*[1]. Stratified random sampling[2] was preferred over simple random sampling for several reasons[3]:

a. To obtain unbiased estimates for different subdivisions of the population with some known level of precision.

b. To obtain unbiased estimates for the whole population. The whole population, or universe of the study, is the non-agricultural economy. It comprises: all manufacturing sectors according to the group classification of ISIC Revision 3.1: (group D), construction sector (group F), services sector (groups G and H), and transport, storage, and communications sector (group I). Note that this 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.

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[1] The complete text can be found at:
http://www.enterprisesurveys.org/~/media/FPDKM/EnterpriseSurveys/Documents/Methodology/Sampling_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] Cochran, W., 1977, pp. 89; Lohr, Sharon, 1999, pp. 95

c. To make sure that the final total sample includes establishments from all different sectors 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 most cases, will be more precise than using a simple random sampling method (i.e., lower standard errors, other things being equal.)

e. Stratification may produce a smaller bound on the error of estimation 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 in the survey may be reduced by stratification of the population elements into convenient groupings.

3.   Three levels of stratification were used in this country: industry, establishment size, and region. The original sample design with specific information of the industries and regions chosen is described in Appendix E.

4.   Industry stratification was designed in the way that follows: the universe was stratified into three manufacturing industry (food, textiles and garments, other manufacturing) and two service sectors (retail and other services).

5.   For the Uganda ES, size stratification was defined following the standardized definition for the rollout: small (5 to 19 employees), medium (20 to 99 employees), and large (more than 99 employees).

6.   Regional stratification for the Uganda ES was defined in six regions (city and the surrounding business area): Jinja, Kampala, Lira, Mbale, Mbarara, and Wakiso.

III. Sampling implementation
7.   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. Great efforts were made to obtain the best source for these listings. However, the quality of the sample frames was not optimal and, therefore, some adjustments were needed to correct for the presence of ineligible units. These adjustments are reflected in the weights computation (*see below*).

8.   TNS Opinion was hired to implement the Africa ES 2013 roll out, including the Uganda 2013 ES. In Uganda the local subcontractor was TNS RMS East Africa Limited.

9.   For the Uganda ES, the sample frame used was obtained from the Uganda Bureau of Statistics. The database contained the following information
- Coverage;
- Up to datedness;
- Availability of detailed stratification variables;
- Location identifiers- address, phone number, email;
- Electronic format availability;
- Contact name(s).

Counts from sample frames are shown below.

Universe (N)

Region name	Sampling Employee size	Food 15	Textile and Apparel 17-18	Other Manufacturing	Retail 52	Other Services	Total
Jinja	Small 5-19	89	2	48	145	169	453
	Med 20-99	10	1	6	3	30	50
	Large 100+	10	0	8	0	4	22
Kampala	Small 5-19	198	84	924	1498	3895	6599
	Med 20-99	103	19	339	120	746	1327
	Large 100+	25	3	19	6	35	88
Lira	Small 5-19	16	7	31	68	137	259
	Med 20-99	9	0	2	2	21	34
	Large 100+	0	0	0	1	1	2
Mbale	Small 5-19	38	10	73	95	258	474
	Med 20-99	12	0	11	1	23	47
	Large 100+	2	0	1	0	3	6
Mbarara	Small 5-19	20	17	91	79	231	438
	Med 20-99	9	0	2	4	25	40
	Large 100+	0	0	3	1	1	5
Wakiso	Small 5-19	62	19	246	286	597	1210
	Med 20-99	36	2	24	12	45	119
	Large 100+	6	0	7	2	6	21
Grand Total		**645**	**164**	**1835**	**2323**	**6227**	**11194**

10. The enumerated establishments with 5 employees or more were then used as the sample frame for the Uganda Enterprise Survey with the aim of obtaining interviews of 600 establishments.

11.   The quality of the frame was assessed at the onset of the project through visits to a random subset of firms and local contractor knowledge. The sample frame was not immune from the typical problems found in establishment surveys: positive rates of non-eligibility, repetition, non-existent units, etc.

12.   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 2% (36 out of 1567 establishments)[4].

IV. Data Base Structure:
13.   The structure of the data base reflects the fact that 3 different versions of the survey instrument were used for all registered establishments. Questionnaires have common questions (*Core* module) and respectfully additional manufacturing and retail specific questions. The eligible manufacturing industries have been surveyed using the ***Manufacturing*** questionnaire (includes the *Core* module, plus manufacturing specific questions). Retail firms have been interviewed using the ***Retail*** questionnaire (includes the *Core* module plus retail specific questions) and the residual eligible services have been covered using the ***Core*** module only. Each variation of the questionnaire is identified by the index variable, *a0*.

14.   All variables 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* (some exceptions apply due to comparability reasons). Variable names proceeded by a prefix *"KEN"* and *"A2F"* indicate questions specific to some countries in Africa, therefore, they may not be found in the implementation of the rollout in other countries. All other suffixed variables are global and are present in all country surveys over the world. 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. In the implementation of the Africa roll out 2011 an experiment was carried in some of the countries to better estimate the effects of the use of show cards in data collection. In some of the sections (i.e. innovation) the enumerators were trained to alternatively implement the section using either show cards or asking only the questions without showing any cards, please see the variable "*cards*".

15.   There are 2 establishment identifiers, *idstd* and *id*. The first is a global unique identifier. The second is a country unique identifier. 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

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[4] Based on out of target contacts and impossible to contact establishments

from the sample frame. The strata were defined according to the guidelines described above.

16. There are three levels of stratification: industry, size and region. Different combinations of these variables generate the strata cells for each industry/region/size combination. 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 one of the chosen industry-strata, whereas the latter gives the actual establishment's industry classification (four digit code) in the sample frame.

17. All of the following variables contain information from the sampling frame. They may not coincide with the reality of individual establishments as sample frames may contain inaccurate information. 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 sampling regions
-*a6a*: coded using the same standard for small, medium, and large establishments as defined 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 chosen industries for stratification. These codes include manufacturing industries (15 to 37), retail (52), and codes 45, 50, 51, 55, 60, 63, 72 for other services.

18. The surveys were implemented following a 2 stage procedure. Typically first a screener questionnaire is applied over the phone to determine eligibility and to make appointments. Then a face-to-face interview takes place with the Manager/Owner/Director of each establishment. In some cases, when the phone numbers were unavailable in the sample frame, the enumerators applied the screeners in person. The variables *a4b* and *a6b* contain the industry and size of the establishment from the screener questionnaire. Variables *a7* to *a11* contain additional information and were also collected in the screening phase.

19. Note that there are variables for size (*l1*, *l6* and *l8*) that reflect more accurately the reality of each establishment. Advanced users are advised to use these variables for analytical purposes. Variables *l1*, *l6* and *l8* were designed to obtain a more accurate measure of employment accounting for permanent and temporary employment. Special efforts were made to make sure that this information was not missing for most establishments.

20. Variables *a17x* gives interviewer comments, including problems that occurred during an interview and extraordinary circumstances which could influence results. Please note that sometimes this variable is removed due to privacy issues.

21. Note that the fiscal years vary by firm as there is no standard for all firms in Uganda. The start and end dates for the fiscal year for each firm can be found in the a20 variables in the dataset

V. Universe Estimates

22.   Universe estimates for the number of establishments in each cell in Uganda were produced for the strict, weak and median eligibility definitions. The estimates were the multiple of the relative eligible proportions.

23.   Appendix B shows the overall estimates of the numbers of establishments in Uganda based on the sample frame.

24.   For some establishments where contact was not successfully completed during the screening process (because the firm has moved and it is not possible to locate the new location, for example), it is not possible to directly determine eligibility. Thus, different assumptions about the eligibility of establishments result in different adjustments to the universe cells and thus different sampling weights.

25. Three sets of assumptions on establishment eligibility are used to construct sample adjustments using the status code information.

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

*Strict eligibility = (Sum of the firms with codes 1,2,3,4,&16) / Total*

27. 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 *wmedian*.

Median eligibility = (Sum of the firms with codes 1,2,3,4,16,10,11, & 13) / Total

28. 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. Under the weak assumption only observed non-eligible units are excluded from universe projections. The resulting weights are included in the variable *wweak*.

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

29. The indicators computed for the Enterprise Survey website use the median weights. The following graph shows the different eligibility rates calculated for firms in each sample frame under each set of assumptions.

Eligibility Rates According to Assumptions Percent Eligible Uganda, 2013
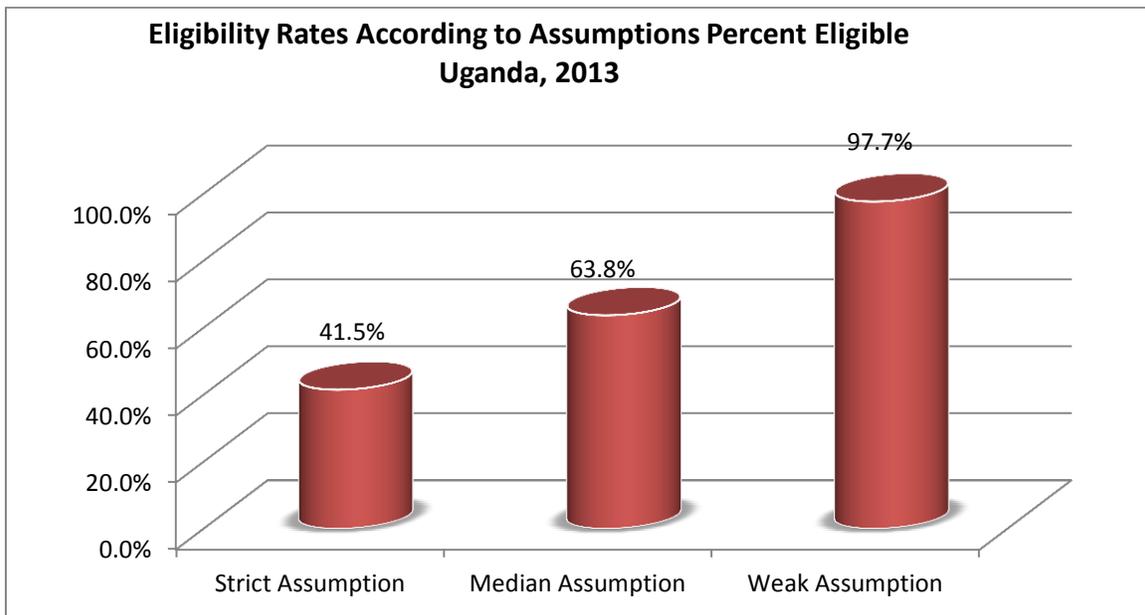
30. Universe estimates for the number of establishments in each industry-region-size cell in Uganda were produced for the strict, weak and median eligibility definitions. Appendix D shows the universe estimates of the numbers of registered establishments that fit the criteria of the Enterprise Surveys.

31. Once an accurate estimate of the universe cell projection was made, weights for the probability of selection were computed using the number of completed interviews for each cell.

VI. Weights

32.   Since the sampling design was stratified and employed differential sampling, 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.)[5]

33.   Special care was given to the correct computation of the weights. It was imperative to accurately adjust the totals within each region/industry/size stratum to account for the presence of ineligible units (the firm discontinued businesses or was unattainable, education or government establishments, establishments with less than 5 employees, no reply after having called in different days of the week and in different

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

business hours, no tone in the phone line, answering machine, fax line[6], wrong address or moved away and could not get the new references) The information required for the adjustment was collected in the first stage of the implementation: the screening process. Using this information, each stratum cell of the universe was scaled down by the observed proportion of ineligible units within the cell. Once an accurate estimate of the universe cell (projections) was available, weights were computed using the number of completed interviews.

34. Appendix C shows the cell weights for registered establishments in Uganda.

VII. Appropriate use of the weights

35. 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.

36. However, there is some discussion as to the 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 Enterprise 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.)[7]

37. 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.[8] If the models are developed as structural relationships or behavioral models that may vary for different parts of the population, then, there is no reason to use weights.

VIII. Non-response

38. Survey non-response must be differentiated from 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. Enterprise Surveys suffer from both problems and different strategies were used to address these issues.

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[6] For the surveys that implemented a screener over the phone.

[7] Note that weighted OLS in Stata using the command regress with the option of weights will estimate wrong standard errors. Using the Stata survey specific commands *svy* will provide appropriate standard errors.

[8] 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.

39.   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 as a different option from don't know (-7).

b- Establishments with incomplete information were re-contacted in order to complete this information, whenever necessary. However, there were clear cases of low response. The following graph shows non-response rates for the sales variable, *d2*, by sector. Please, note that the coding utilized in this dataset does not allow us to differentiate between "Don't know" and "refuse to answer", thus the non-response in the charts below for both enterprise surveys (ES) and micro firms reflect both categories (DKs and NAs).

Sales Non-response Rates
Uganda, 2013

Manufacturing	Retail	Other Services
28.81%	44.08%	39.44%
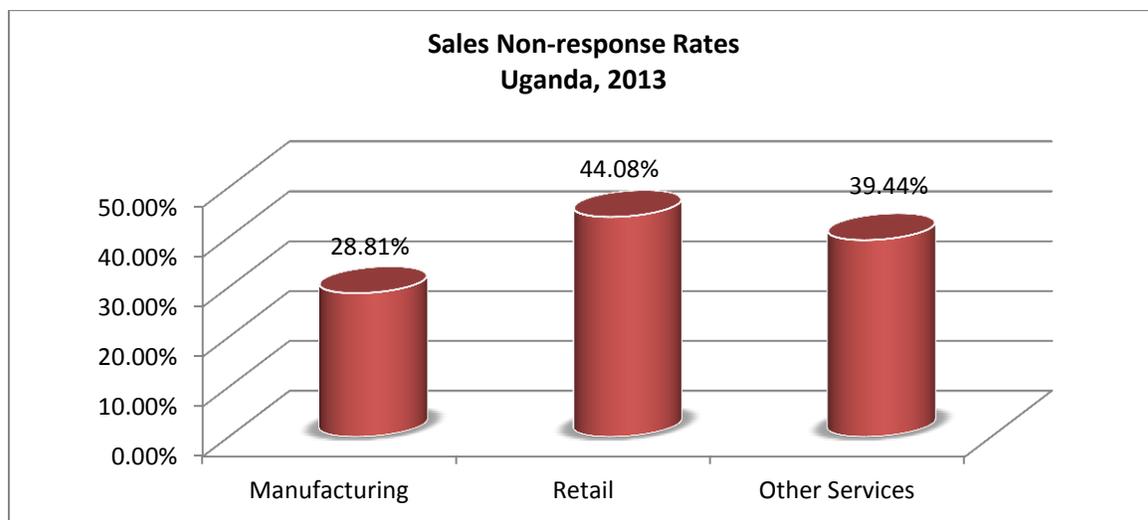
40.   Survey non-response was addressed by maximizing efforts to contact establishments that were initially selected for interview. Attempts were made to contact the establishment for interview at different times/days of the week before a replacement establishment (with similar strata characteristics) was suggested for interview. Survey non-response did occur but substitutions were made in order to potentially achieve strata-specific goals. Further research is needed on survey non-response in the Enterprise Surveys regarding potential introduction of bias.

41.   As the following graphs show, the number of contacted establishments per realized interview was 0.41.[9] This number is the result of two factors: explicit refusals to participate in the survey, as 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. The number of rejections per contact was 0.20.

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[9] The estimate is based on the total no. of firms contacted including ineligible establishments.

Rejection rate and Interviews per Contact Uganda, 2013
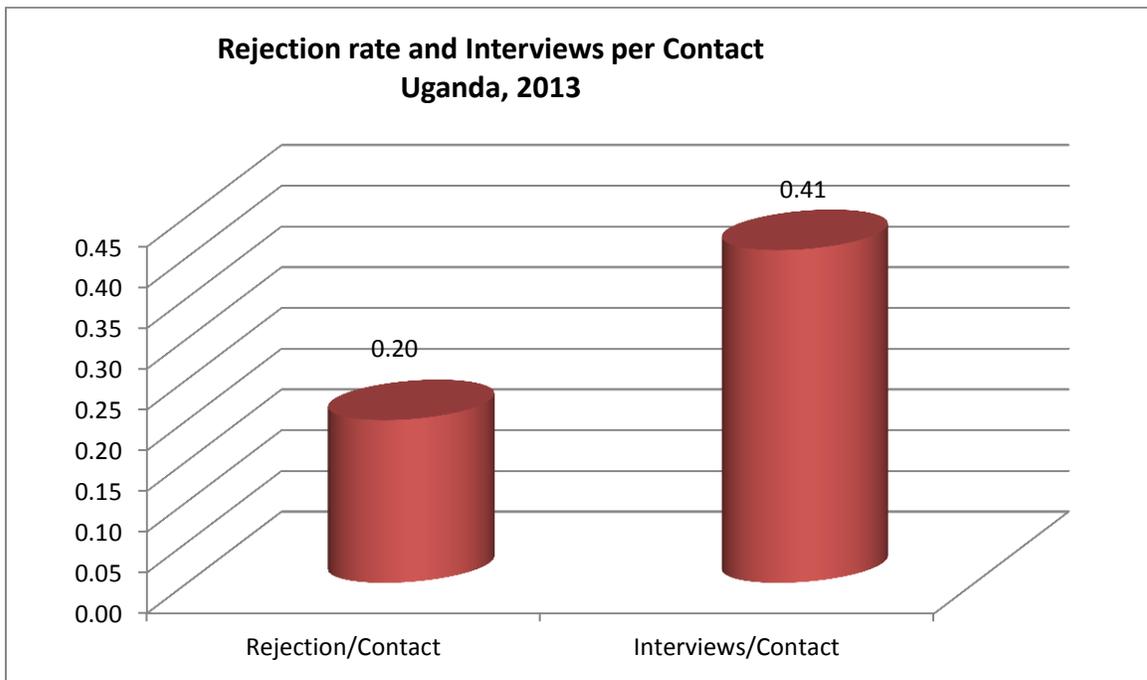
42.   Details on the rejection rate, eligibility rate, and item non-response are available at the level strata. This report summarizes these numbers to alert researchers of these issues when using the data and when making inferences. Item non-response, selection bias, and faulty sampling frames are not unique to Uganda. All enterprise surveys suffer from these shortcomings, but in very few cases they have been made explicit.

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

Status Codes Total:

	ELIGIBLES	
Eligible	1.Eligible establishment *(Correct name and address)*	645
	2. Eligible establishment *(Different name but same address - the new firm/establishment bought the original firm/establishment)*	0
	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)*	6
	16. Panel firm - now less than five employees	0
Ineligible	5. The establishment has less than 5 permanent full time employees	14
	6. The firm discontinued businesses	15
	7. Not a business: private household	0
	8. Ineligible activity: education, agriculture, finances, governments…	5
Unobtainable	91. No reply *(after having called in different days of the week and in different business hours)*	78
	92. Line out of order	28
	93. No tone	1
	94. Phone number does not exist	6
	10. Answering machine	17
	11. Fax line - data line	18
	12. Wrong address/ moved away and could not get the new references	419
	13. Refuses to answer the screener	313
	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 152. Out of target - firm moved abroad 153. Impossible to find	2
	Total	1567

Response Outcomes Total:

Complete interviews *(Total)*	640
Incomplete interviews	2
Eligible in process	9
Refusals	0
Out of target	34
Impossible to contact	567
Ineligible - coop.	2
Refusal to the Screener	313
Total	1567

Status Codes Fresh:

	ELIGIBLES	
Eligible	1.Eligible establishment *(Correct name and address)*	556
	2. Eligible establishment *(Different name but same address - the new firm/establishment bought the original firm/establishment)*	0
	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)*	6
	16. Panel firm - now less than five employees	0
Ineligible	5. The establishment has less than 5 permanent full time employees	14
	6. The firm discontinued businesses	12
	7. Not a business: private household	0
	8. Ineligible activity: education, agriculture, finances, governments…	5
Unobtainable	91. No reply *(after having called in different days of the week and in different business hours)*	65
	92. Line out of order	22
	93. No tone	1
	94. Phone number does not exist	0
	10. Answering machine	16
	11. Fax line - data line	18
	12. Wrong address/ moved away and could not get the new references	403
	13. Refuses to answer the screener	268
	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 152. Out of target - firm moved abroad 153. Impossible to find	2
	Total	1388

Response Outcomes Fresh:

Complete interviews *(Total)*	533
Incomplete interviews	1
Eligible in process	8
Refusals	0
Out of target	31
Impossible to contact	525
Ineligible - coop.	2
Refusal to the Screener	268
Total	1388

Status Codes Panel:

	ELIGIBLES	
Eligible	1. Eligible establishment *(Correct name and address)*	89
	2. Eligible establishment *(Different name but same address - the new firm/establishment bought the original firm/establishment)*	0
	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)*	0
	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…	0
Unobtainable	91. No reply *(after having called in different days of the week and in different business hours)*	13
	92. Line out of order	6
	93. No tone	0
	94. Phone number does not exist	6
	10. Answering machine	1
	11. Fax line - data line	0
	12. Wrong address/ moved away and could not get the new references	16
	13. Refuses to answer the screener	45
	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	
	153. Impossible to find	
	Total	179

Response Outcomes Panel:

Complete interviews *(Total)*	87
Incomplete interviews	1
Eligible in process	1
Refusals	0
Out of target	3
Impossible to contact	42
Ineligible - coop.	0
Refusal to the Screener	45
Total	179

Appendix B

Universe Estimates, Uganda:

Enterprise Survey
Source: Uganda Bureau of Statistic 2010/2011 Census

Universe (N)

Region name	Sampling Employee size	Food 15	Textile and Apparel 17-18	Other Manufacturing	Retail 52	Other Services	Total
Jinja	Small 5-19	89	2	48	145	169	453
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Appendix C

Strict Cell Weights Fresh Uganda:

Row Labels	Food	Textile and Apparel	Other Manufacturing	Retail	Other Services
Jinja					
Small (5 to 19)	10.3	1.0	1.0	5.5	11.8
Medium (20 to 99)	1.0	0.0	1.1	1.0	1.4
Large (100+)	1.7	0.0	1.0	0.0	2.0
Kampala					
Small (5 to 19)	41.9	1.8	59.6	15.3	41.2
Medium (20 to 99)	6.7	1.3	3.4	2.4	59.0
Large (100+)	1.0	1.3	2.1	1.3	2.4
Lira					
Small (5 to 19)	1.4	0.0	1.0	1.9	41.1
Medium (20 to 99)	1.0	0.0	1.0	0.0	1.0
Large (100+)	0.0	0.0	0.0	0.0	1.0
Mbale					
Small (5 to 19)	2.9	1.2	1.2	2.2	24.9
Medium (20 to 99)	1.0	0.0	1.6	0.0	1.0
Large (100+)	1.0	0.0	0.0	0.0	1.0
Mbarara					
Small (5 to 19)	1.0	1.2	1.2	2.1	6.6
Medium (20 to 99)	1.0	0.0	0.0	1.5	2.2
Large (100+)	0.0	0.0	1.0	1.0	0.0
Wakiso					
Small (5 to 19)	27.1	1.1	25.7	7.7	81.9
Medium (20 to 99)	1.0	1.0	1.0	1.0	1.8
Large (100+)	2.3	0.0	1.0	1.0	1.1

Strict Cell Weights Panel Uganda:

Row Labels	Food	Textile and Apparel	Other Manufacturing	Retail	Other Services
Jinja					
Small (5 to 19)	1.0	0.0	1.0	0.0	0.0
Medium (20 to 99)	1.0	0.0	1.4	0.0	0.0
Large (100+)	3.0	0.0	0.0	0.0	0.0
Kampala					
Small (5 to 19)	6.8	2.2	4.3	4.5	4.4
Medium (20 to 99)	19.6	0.0	4.9	9.5	8.9
Large (100+)	3.0	0.0	9.1	0.0	3.4
Lira					
Small (5 to 19)	0.0	0.0	1.5	0.0	0.0
Medium (20 to 99)	0.0	0.0	0.0	0.0	0.0
Large (100+)	0.0	0.0	0.0	0.0	0.0
Mbale					
Small (5 to 19)	0.0	0.0	0.0	0.0	0.0
Medium (20 to 99)	1.0	0.0	0.0	0.0	0.0
Large (100+)	0.0	0.0	0.0	0.0	0.0
Mbarara					
Small (5 to 19)	1.0	0.0	1.1	1.1	1.0
Medium (20 to 99)	0.0	0.0	0.0	0.0	0.0
Large (100+)	0.0	0.0	0.0	0.0	0.0
Wakiso					
Small (5 to 19)	0.0	0.0	0.0	0.0	0.0
Medium (20 to 99)	0.0	0.0	0.0	0.0	0.0
Large (100+)	0.0	0.0	0.0	0.0	0.0

Median Cell Weights Fresh Uganda:

Row Labels	Food	Textile and Apparel	Other Manufacturing	Retail	Other Services
Jinja					
Small (5 to 19)	14.7	1.0	1.5	6.8	15.9
Medium (20 to 99)	1.2	0.0	1.8	1.0	2.0
Large (100+)	3.8	0.0	1.1	0.0	4.1
Kampala					
Small (5 to 19)	59.6	1.8	86.3	19.1	55.3
Medium (20 to 99)	10.5	1.4	5.4	3.3	87.7
Large (100+)	2.3	2.0	4.8	2.5	5.0
Lira					
Small (5 to 19)	2.9	0.0	2.0	3.4	78.4
Medium (20 to 99)	1.1	0.0	1.0	0.0	1.1
Large (100+)	0.0	0.0	0.0	0.0	1.0
Mbale					
Small (5 to 19)	4.4	1.3	1.9	2.8	35.2
Medium (20 to 99)	1.1	0.0	2.7	0.0	1.4
Large (100+)	2.1	0.0	0.0	0.0	1.0
Mbarara					
Small (5 to 19)	1.4	1.3	1.8	2.9	9.4
Medium (20 to 99)	1.1	0.0	0.0	2.2	3.5
Large (100+)	0.0	0.0	1.9	1.0	0.0
Wakiso					
Small (5 to 19)	47.3	1.4	45.7	11.8	134.8
Medium (20 to 99)	1.9	1.0	1.6	1.5	3.2
Large (100+)	6.1	0.0	2.0	1.8	2.7

Median Cell Weights Panel Uganda:

	Food	Textile and Apparel	Other Manufacturing	Retail	Other Services
Jinja					
Small (5 to 19)	1.2	0.0	1.0	0.0	0.0
Medium (20 to 99)	1.0	0.0	1.6	0.0	0.0
Large (100+)	3.1	0.0	0.0	0.0	0.0
Kampala					
Small (5 to 19)	6.9	2.1	4.5	4.6	5.5
Medium (20 to 99)	19.9	0.0	5.1	9.6	10.9
Large (100+)	2.8	0.0	8.8	0.0	3.9
Lira					
Small (5 to 19)	0.0	0.0	6.3	0.0	0.0
Medium (20 to 99)	0.0	0.0	0.0	0.0	0.0
Large (100+)	0.0	0.0	0.0	0.0	0.0
Mbale					
Small (5 to 19)	0.0	0.0	0.0	0.0	0.0
Medium (20 to 99)	1.0	0.0	0.0	0.0	0.0
Large (100+)	0.0	0.0	0.0	0.0	0.0
Mbarara					
Small (5 to 19)	1.0	0.0	1.2	1.2	1.1
Medium (20 to 99)	0.0	0.0	0.0	0.0	0.0
Large (100+)	0.0	0.0	0.0	0.0	0.0
Wakiso					
Small (5 to 19)	0.0	0.0	0.0	0.0	0.0
Medium (20 to 99)	0.0	0.0	0.0	0.0	0.0
Large (100+)	0.0	0.0	0.0	0.0	0.0

Weak Cell Weights Fresh Uganda:

Row Labels	Food	Textile and Apparel	Other Manufacturing	Retail	Other Services
Jinja					
Large (100+)	3.1	0.0	1.2	0.0	3.8
Medium (20 to 99)	1.4	0.0	2.9	1.0	2.7
Small (5 to 19)	16.1	1.0	2.2	8.5	19.7
Kampala					
Large (100+)	2.3	2.9	6.5	2.9	5.7
Medium (20 to 99)	15.3	3.0	10.7	5.4	143.4
Small (5 to 19)	81.1	3.6	159.6	29.5	84.7
Lira					
Large (100+)	0.0	0.0	0.0	0.0	1.0
Medium (20 to 99)	1.8	0.0	2.0	0.0	2.0
Small (5 to 19)	4.3	0.0	3.9	5.7	131.2
Mbale					
Large (100+)	1.9	0.0	0.0	0.0	1.0
Medium (20 to 99)	1.5	0.0	4.8	0.0	2.0
Small (5 to 19)	5.5	2.4	3.2	4.0	49.3
Mbarara					
Large (100+)	0.0	0.0	3.0	1.0	0.0
Medium (20 to 99)	1.8	0.0	0.0	4.0	6.3
Small (5 to 19)	2.1	2.8	3.8	4.9	16.0
Wakiso					
Large (100+)	5.7	0.0	2.5	1.9	2.9
Medium (20 to 99)	2.5	1.9	2.9	2.3	4.9
Small (5 to 19)	59.9	2.6	78.8	17.0	192.4

Weak Cell Weights Panel Uganda:

Row Labels	Food	Textile and Apparel	Other Manufacturing	Retail	Other Services
Jinja					
Large (100+)	3.1	0.0	0.0	0.0	0.0
Medium (20 to 99)	1.0	0.0	1.7	0.0	0.0
Small (5 to 19)	1.2	0.0	1.0	0.0	0.0
Kampala					
Large (100+)	2.6	0.0	8.6	0.0	4.2
Medium (20 to 99)	19.6	0.0	5.2	9.9	12.2
Small (5 to 19)	7.0	2.5	4.7	4.9	6.2
Lira					
Large (100+)	0.0	0.0	0.0	0.0	0.0
Medium (20 to 99)	0.0	0.0	0.0	0.0	0.0
Small (5 to 19)	0.0	0.0	6.6	0.0	0.0
Mbale					
Large (100+)	0.0	0.0	0.0	0.0	0.0
Medium (20 to 99)	1.0	0.0	0.0	0.0	0.0
Small (5 to 19)	0.0	0.0	0.0	0.0	0.0
Mbarara					
Large (100+)	0.0	0.0	0.0	0.0	0.0
Medium (20 to 99)	0.0	0.0	0.0	0.0	0.0
Small (5 to 19)	1.4	0.0	1.7	1.8	1.7
Wakiso					
Large (100+)	0.0	0.0	0.0	0.0	0.0
Medium (20 to 99)	0.0	0.0	0.0	0.0	0.0
Small (5 to 19)	0.0	0.0	0.0	0.0	0.0

Appendix D

Strict Universe Estimates

	Food	Textile and Apparel	Other Manufacturing	Retail	Other Services	Grand Total
Jinja	**73**	**2**	**32**	**85**	**110**	**302**
Small (5 to 19)	54	2	21	82	95	254
Medium (20 to 99)	10	0	5	3	14	32
Large (100+)	8	0	6	0	2	16
Kampala	**176**	**51**	**525**	**828**	**2224**	**3804**
Small (5 to 19)	111	42	384	771	1896	3203
Medium (20 to 99)	53	8	125	55	313	554
Large (100+)	12	1	16	3	16	47
Lira	**9**	**0**	**9**	**21**	**52**	**91**
Small (5 to 19)	4	0	8	21	41	74
Medium (20 to 99)	5	0	1	0	10	16
Large (100+)	0	0	0	0	1	1
Mbale	**28**	**5**	**29**	**45**	**137**	**244**
Small (5 to 19)	18	5	26	45	124	218
Medium (20 to 99)	9	0	3	0	10	22
Large (100+)	1	0	0	0	3	4
Mbarara	**15**	**7**	**32**	**37**	**104**	**196**
Small (5 to 19)	10	7	31	35	96	179
Medium (20 to 99)	5	0	0	1	9	15
Large (100+)	0	0	1	1	0	2
Wakiso	**43**	**9**	**88**	**129**	**264**	**533**
Small (5 to 19)	27	8	77	123	246	481
Medium (20 to 99)	14	1	8	5	16	44
Large (100+)	2	0	3	1	2	8
Grand Total	**344**	**73**	**715**	**1146**	**2892**	**5170**

Weak Universe Estimates

	Food	Textile and Apparel	Other Manufacturing	Retail	Other Services	Grand Total
Jinja	**109**	**2**	**62**	**131**	**188**	**492**
Small (5 to 19)	84	2	45	128	158	417
Medium (20 to 99)	13	0	9	3	27	51
Large (100+)	12	0	7	0	4	24
Kampala	**309**	**102**	**1245**	**1558**	**4642**	**7856**
Small (5 to 19)	190	82	892	1440	3867	6471
Medium (20 to 99)	96	18	325	112	741	1292
Large (100+)	23	3	28	6	33	93
Lira	**22**	**0**	**32**	**62**	**152**	**269**
Small (5 to 19)	13	0	30	62	131	237
Medium (20 to 99)	9	0	2	0	20	31
Large (100+)	0	0	0	0	1	1
Mbale	**47**	**9**	**77**	**84**	**270**	**488**
Small (5 to 19)	33	9	67	84	247	440
Medium (20 to 99)	13	0	10	0	20	43
Large (100+)	2	0	0	0	3	5
Mbarara	**29**	**17**	**93**	**81**	**256**	**476**
Small (5 to 19)	20	17	90	76	231	433
Medium (20 to 99)	9	0	0	4	25	38
Large (100+)	0	0	3	1	0	4
Wakiso	**101**	**20**	**267**	**285**	**627**	**1299**
Small (5 to 19)	60	18	236	271	577	1163
Medium (20 to 99)	35	2	23	11	44	116
Large (100+)	6	0	8	2	6	21
Grand Total	**618**	**150**	**1776**	**2201**	**6136**	**10880**

Median Universe Estimates

Row Labels	Food	Textile and Apparel	Other Manufacturing	Retail	Other Services	Grand Total
Jinja	**103**	**2**	**44**	**105**	**152**	**406**
Small (5 to 19)	77	2	31	102	127	339
Medium (20 to 99)	11	0	7	3	20	41
Large (100+)	15	0	7	0	4	25
Kampala	**243**	**52**	**726**	**1027**	**3026**	**5073**
Small (5 to 19)	147	42	521	950	2536	4196
Medium (20 to 99)	72	8	182	72	461	795
Large (100+)	23	2	23	5	29	82
Lira	**14**	**0**	**19**	**37**	**91**	**161**
Small (5 to 19)	9	0	18	37	78	142
Medium (20 to 99)	6	0	1	0	11	18
Large (100+)	0	0	0	0	1	1
Mbale	**38**	**5**	**45**	**60**	**192**	**340**
Small (5 to 19)	26	5	40	60	176	306
Medium (20 to 99)	10	0	5	0	14	29
Large (100+)	2	0	0	0	3	5
Mbarara	**19**	**8**	**48**	**48**	**150**	**272**
Small (5 to 19)	13	8	46	45	136	247
Medium (20 to 99)	6	0	0	2	14	22
Large (100+)	0	0	2	1	0	3
Wakiso	**79**	**11**	**156**	**198**	**439**	**883**
Small (5 to 19)	47	10	137	189	404	788
Medium (20 to 99)	26	1	13	7	29	76
Large (100+)	6	0	6	2	5	19
Grand Total	**496**	**77**	**1038**	**1475**	**4049**	**7135**

Appendix E

Original Sample Design, Uganda:

Sample Design

Region name	Sampling Employee size	Food 15	Textile and Apparel 17-18	Other Manufac turing	Retail 52	Other Services	Total
Jinja	Small 5-19	3	2	10	12	3	30
	Med 20-99	10	1	4	3	9	27
	Large 100+	10	0	8	0	4	22
		23	3	22	15	16	79
Kampala	Small 5-19	3	12	7	24	25	71
	Med 20-99	3	14	30	11	3	61
	Large 100+	15	3	19	6	5	48
		21	29	56	41	33	180
Lira	Small 5-19	4	7	12	16	3	42
	Med 20-99	9	0	2	2	19	32
	Large 100+	0	0	0	1	1	2
		13	7	14	19	23	76
Mbale	Small 5-19	3	10	13	11	3	40
	Med 20-99	12	0	8	1	10	31
	Large 100+	2	0	1	0	3	6
		17	10	22	12	16	77
Mbarara	Small 5-19	3	9	18	6	5	41
	Med 20-99	9	0	2	4	15	30
	Large 100+	0	0	3	1	1	5
		12	9	23	11	21	76
Wakiso	Small 5-19	3	10	3	8	3	27
	Med 20-99	25	2	23	12	4	66
	Large 100+	6	0	7	2	4	19
		34	12	33	22	11	112
Grand Total		120	70	170	120	120	600

Completed Interviews Total, Uganda:

	Food	Textile and Apparel	Other Manufacturing	Retail	Other Services
Jinja					
Large (100+)	4	0	6	0	1
Medium (20 to 99)	10	0	4	3	10
Small (5 to 19)	8	2	21	15	8
Kampala					
Large (100+)	10	1	4	2	6
Medium (20 to 99)	6	6	34	20	7
Small (5 to 19)	6	23	25	58	54
Lira					
Large (100+)	0	0	0	0	1
Medium (20 to 99)	5	0	1	0	10
Small (5 to 19)	3	0	7	11	1
Mbale					
Large (100+)	1	0	0	0	3
Medium (20 to 99)	9	0	2	0	10
Small (5 to 19)	6	4	21	21	5
Mbarara					
Large (100+)	0	0	1	1	0
Medium (20 to 99)	5	0	0	1	4
Small (5 to 19)	10	6	27	18	18
Wakiso					
Large (100+)	1	0	3	1	2
Medium (20 to 99)	14	1	8	5	9
Small (5 to 19)	1	7	3	16	3

Completed Interviews Fresh, Uganda:

	Food	Textile and Apparel	Other Manufacturing	Retail	Other Services	Grand Total
Jinja	**22**	**2**	**31**	**18**	**19**	**92**
Large (100+)	4	0	6	0	1	11
Medium (20 to 99)	10	0	4	3	10	27
Small (5 to 19)	8	2	21	15	8	54
Kampala	**22**	**30**	**63**	**80**	**67**	**262**
Large (100+)	10	1	4	2	6	23
Medium (20 to 99)	6	6	34	20	7	73
Small (5 to 19)	6	23	25	58	54	166
Lira	**8**	**0**	**8**	**11**	**12**	**39**
Large (100+)	0	0	0	0	1	1
Medium (20 to 99)	5	0	1	0	10	16
Small (5 to 19)	3	0	7	11	1	22
Mbale	**16**	**4**	**23**	**21**	**18**	**82**
Large (100+)	1	0	0	0	3	4
Medium (20 to 99)	9	0	2	0	10	21
Small (5 to 19)	6	4	21	21	5	57
Mbarara	**15**	**6**	**28**	**20**	**22**	**91**
Large (100+)	0	0	1	1	0	2
Medium (20 to 99)	5	0	0	1	4	10
Small (5 to 19)	10	6	27	18	18	79
Wakiso	**16**	**8**	**14**	**22**	**14**	**74**
Large (100+)	1	0	3	1	2	7
Medium (20 to 99)	14	1	8	5	9	37
Small (5 to 19)	**1**	**7**	**3**	**16**	**3**	**30**
Grand Total	**99**	**50**	**167**	**172**	**152**	**640**

Completed Interviews Panel, Uganda:

	Food	Other Manufacturing	Other Services	Retail	Textile and Apparel	Grand Total
Jinja	**7**	**3**	**0**	**0**	**0**	**10**
Small (5 to 19)	3	1	0	0	0	4
Medium (20 to 99)	3	2	0	0	0	5
Large (100+)	1	0	0	0	0	1
Kampala	**6**	**28**	**12**	**12**	**1**	**59**
Small (5 to 19)	4	20	9	11	1	45
Medium (20 to 99)	1	7	2	1	0	11
Large (100+)	1	1	1	0	0	3
Lira	**0**	**1**	**0**	**0**	**0**	**1**
Small (5 to 19)	0	1	0	0	0	1
Medium (20 to 99)	0	0	0	0	0	0
Large (100+)	0	0	0	0	0	0
Mbale	**1**	**0**	**0**	**0**	**0**	**1**
Small (5 to 19)	0	0	0	0	0	0
Medium (20 to 99)	1	0	0	0	0	1
Large (100+)	0	0	0	0	0	0
Mbarara	**2**	**6**	**4**	**4**	**0**	**16**
Small (5 to 19)	2	6	4	4	0	16
Medium (20 to 99)	0	0	0	0	0	0
Large (100+)	0	0	0	0	0	0
Wakiso	**0**	**0**	**0**	**0**	**0**	**0**
Small (5 to 19)	0	0	0	0	0	0
Medium (20 to 99)	0	0	0	0	0	0
Large (100+)	0	0	0	0	0	0
Grand Total	**16**	**38**	**16**	**16**	**1**	**87**

Appendix F

Local Agency team involved in the study:

Local Agencies	**Name:** TNS RMS East Africa Limited **Country:** Uganda **Activities since:** 1975
Enumerators involved:	**Enumerators:** 10 **Recruiters**: 2
Other staff involved:	**Fieldwork Coordinators:** 1 **Data Processing:** 4

Sample Frame:

Characteristic of sample frame used:	List of registered companies operating in Uganda
Source:	Uganda Bureau of Statistic in 2010/2011
Year:	2010 - 2011

Sectors included in the Sample:

Original Sectors	The manufacturing sector comprises all manufacturing establishments as mentioned in group D The service sector includes Retail (Group H – 52); Group F (construction), Groups G without 52 and H (Hotel and restaurant), Group I (transport, storage, and communications) and subsector 72 from Group K
Added (top up) Sectors	None

Fieldwork and country situation:

Date of Fieldwork	1st Jan 2013 to 16th August 2013
Country	Uganda
Use of CAPI	• Computer-assisted personal interviewing (CAPI) was used to collected data. The **SODA** mobile research app was used
Problems found during fieldwork:	• It was extremely difficult to meet the managers of establishments with sample size 100+ they are so busy and mobile. • Some respondents were unwilling to share some information which they termed as "sensitive" particularly on their financial position
Country specific situation	• Fiscal years differ across firms • Generally business owners show apprehension towards meeting tax assessors. • The cost of doing business is high due to high inflation rate; cost of electricity, fuel labour, rent, water is so high.