

The Senegal 2014 Enterprise Surveys Data Set

I. Introduction

1. This document provides additional information on the data collected in Senegal between May 2014 and February 2015. The objective of the Enterprise Survey is to gain an understanding of what firms experience in the private sector.

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 Senegal was selected using stratified random sampling, following the methodology explained in the *Sampling Manual*¹. Stratified random sampling² was preferred over simple random sampling for several reasons³:

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.

¹ The complete text 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 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 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 two manufacturing industries (Food, Other manufacturing) and three service sectors (Retail, Tourism, and Other services).

5. For the Senegal Enterprise Survey (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 Senegal ES was defined in four regions: Dakar, Kaolack, Saint-Louis, and Thies.

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 Senegal 2014 enterprise surveys roll out.

9. Two frames were used. The World Bank supplied the first frame that consists of enterprises interviewed in Senegal 2007. The World Bank required that attempts should be made to re-interview establishments responding to the Senegal 2007 survey where they were within the selected geographical regions and met eligibility criteria. Due to the fact that the previous round of surveys seemed to have utilized different stratification criteria (or no stratification at all) and due to the prevalence of small firms and firms located in the capital city in the 2007 sample the following convention was used. The presence of panel firms was limited to a maximum of 50% of the achieved interviews in each cell. That sample is referred to as the Panel. The second frame was the Répertoire National des Entreprises et associations (RNEA) from the Agence Nationale de la

Statistique et de la Démographie (ANSD). Counts of firms in the sample frame can be found in Appendix B. The database contained the following information

- Detailed stratification variables;
- Location identifiers- address, phone number, email;
- Contact name(s).

10. The enumerated establishments with 5 employees or more (fresh and panel) were then used as the sample frame for the Senegal Enterprise Survey with the aim of obtaining interviews at 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. In addition, the sample frame does not contain telephone/fax numbers for all firms, so the local contractor had to screen some contacts by visiting them.

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 7.4% (99 out of 1,342 establishments)⁴.

Breaking down by industries and size, the following sample targets were achieved (using screener variables a3a, a4b and a6b). Please note that we do have micro firms (less than 5 employees) that were interviewed as these were panel firms- firms that were interviewed in 2007- that have now become micro firms.

***ES Achieved -
Total***

	1-Food	2-Other Manufacturing	3-Retail	4- Tourism	5-Other Services	Grand Total
Dakar	78	82	55	86	68	369
0-Micro		3	6		2	11
1-Small	46	41	42	50	36	215
2-Medium	22	25	7	33	15	102
3-Large	10	13		3	15	41
Kaolack	23	10	18	4	12	67
0-Micro		2	1		1	4
1-Small	19	7	15	4	10	55
2-Medium	3	1	2			6
3-Large	1				1	2
Saint-Louis	7	12	15	13	5	52
1-Small	7	12	15	12	5	51

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

2-Medium				1		1
3-Large						
Thiès	18	19	28	23	25	113
0-Micro		1				1
1-Small	13	16	25	15	16	85
2-Medium	4	2	3	7	6	22
3-Large	1			1	3	5
Grand Total	126	123	116	126	110	601

***ES Achieved -
fresh***

	1-Food	2-Other Manufacturing	3-Retail	4- Tourism	5-Other Services	Grand Total
Dakar	45	35	30	70	47	227
1-Small	24	11	25	39	21	120
2-Medium	15	15	5	29	13	77
3-Large	6	9		2	13	30
Kaolack	11	1	10		10	32
1-Small	10	1	9		9	29
2-Medium	1		1			2
3-Large					1	1
Saint-Louis	4	4	9	10	2	29
1-Small	4	4	9	9	2	28
2-Medium				1		1
3-Large						
Thiès	13	3	20	17	22	75
1-Small	8	3	18	9	15	53
2-Medium	4		2	7	4	17
3-Large	1			1	3	5
Grand Total	73	43	69	97	81	363

***ES Achieved -
panel***

	1-Food	2-Other Manufacturing	3-Retail	4- Tourism	5-Other Services	Grand Total
Dakar	33	47	25	16	21	142
0-Micro		3	6		2	11
1-Small	22	30	17	11	15	95
2-Medium	7	10	2	4	2	25
3-Large	4	4		1	2	11
Kaolack	12	9	8	4	2	35

0-Micro		2	1		1	4
1-Small	9	6	6	4	1	26
2-Medium	2	1	1			4
3-Large	1					1
Saint-Louis	3	8	6	3	3	23
0-Micro						
1-Small	3	8	6	3	3	23
2-Medium						
3-Large						
Thiès	5	16	8	6	3	38
0-Micro		1				1
1-Small	5	13	7	6	1	32
2-Medium		2	1		2	5
3-Large						
Grand Total	53	80	47	29	29	238

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 (**Other Services** questionnaire). 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 “SNG” indicate questions specific to Senegal, 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.

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 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 micro, 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 most manufacturing industries (15 to 37), other manufacturing (2), retail (52), and (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. However, the phone numbers were unavailable in the sample frame, and thus 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 *a8* 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. Fiscal years in Senegal are in accordance with the calendar year

V. Universe Estimates

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

22. Appendix B shows the overall estimates of the numbers of establishments in Senegal based on the sample frame.

23. 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.

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

25. 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*.

$$\text{Strict eligibility} = (\text{Sum of the firms with codes 1,2,3,4,\&16}) / \text{Total}$$

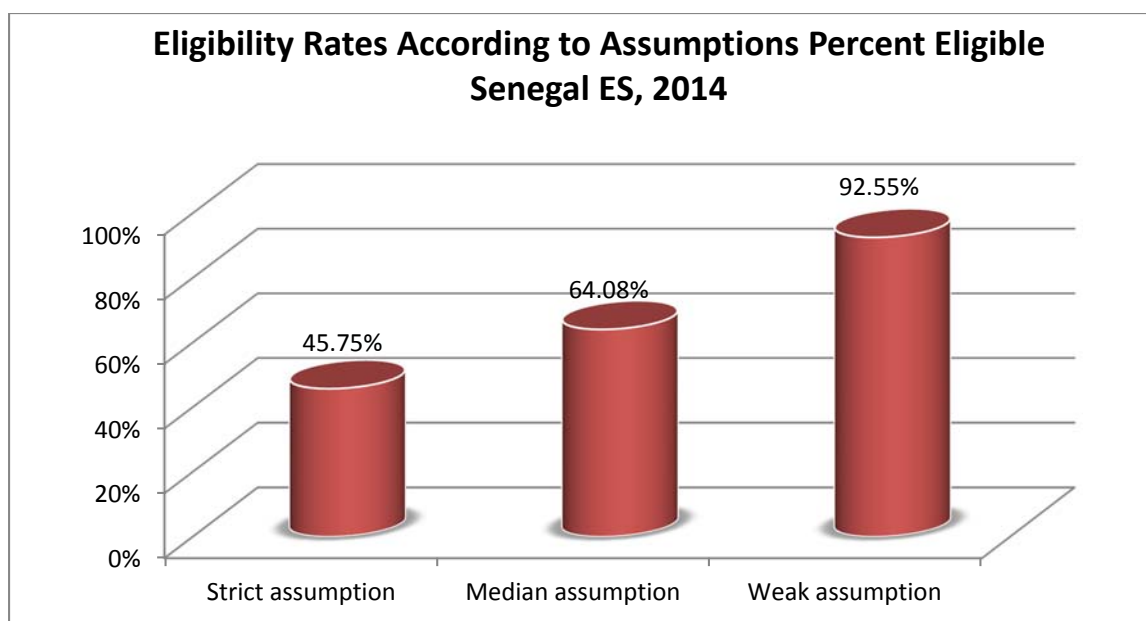
26. Median assumption: eligible establishments are those for which it was possible to directly determine eligibility and those that rejected the screener questionnaire or an answering machine or fax was the only response. The resulting weights are included in the variable *wmedian*.

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

27. 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*.

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

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



29. Universe estimates for the number of establishments in each industry-region-size cell in Senegal 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.

30. 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

31. 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

32. 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 business hours, no tone in the phone line, answering machine, fax line⁶, 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

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

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

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.

33. For Retail and Other Services sectors in Dakar, we decided to combine all firm sizes into one overall category (“All sizes combined”) thereby providing equal weights. This was done due to the lack of achieved interviews. Therefore, weights in these two sectors in Dakar are not size-specific.

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

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 use 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.

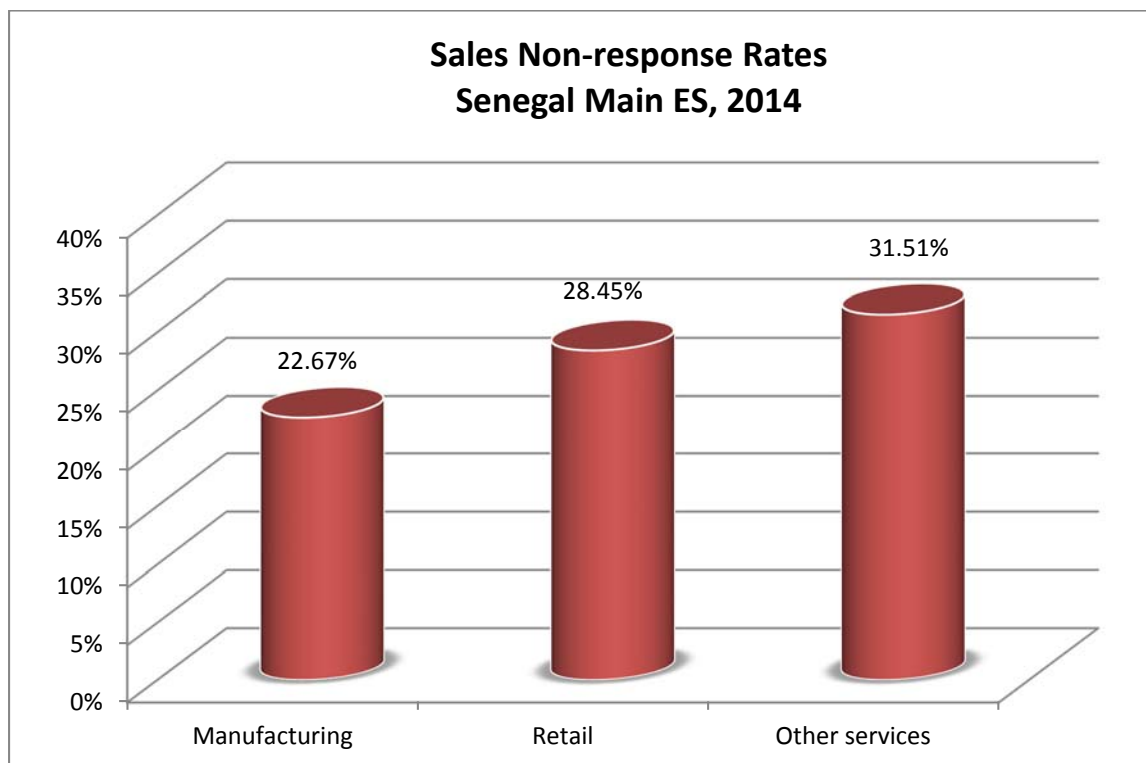
VIII. Non-response

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.

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 reflect both categories (DKs and NAs).

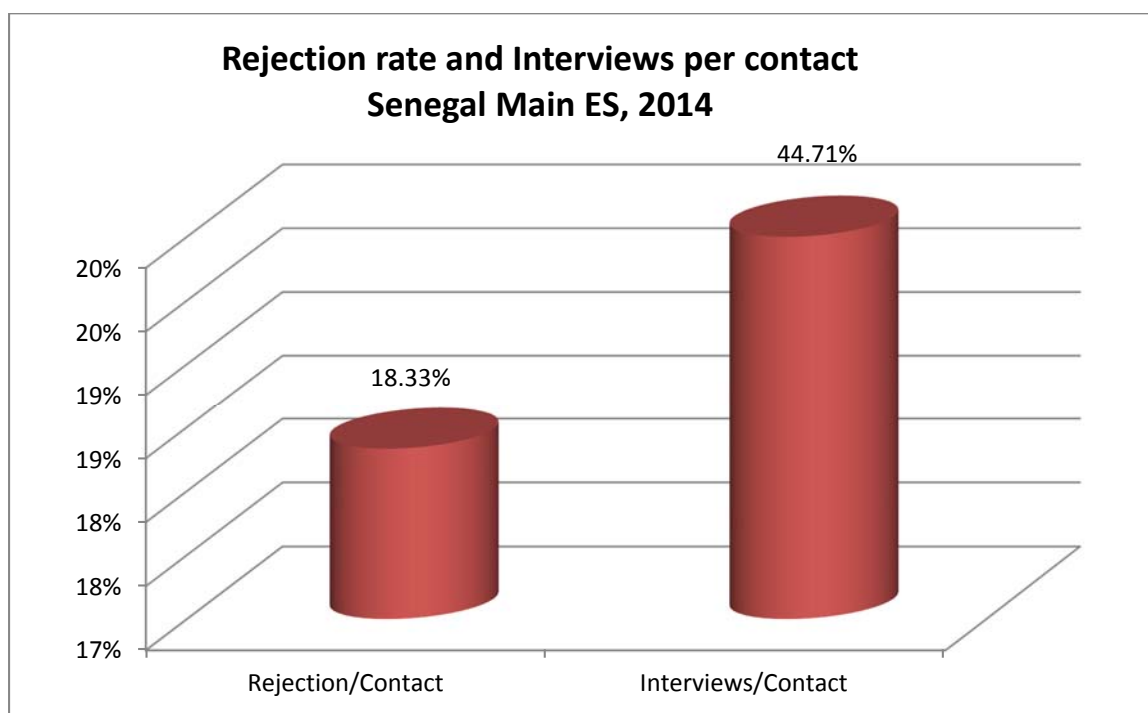


40. Survey non-response was addressed by maximizing efforts to contact establishments that were initially selected for interview. Attempts were made to contact the establishment for interview at different times/days of the week before a replacement establishment (with similar strata characteristics) 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 graph shows, the percentage of interviews per contacted establishments was 44.71%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

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

the screener and the main survey) and the quality of the sample frame, as represented by the presence of ineligible units. The percentage of rejections per contact was 18.33%.



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 Senegal. 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. Sampling: Design and Techniques, 1999.
- Scheaffer, Richard L.; Mendenhall, W.; Lyman, R., Elementary Survey Sampling, Fifth Edition, 1996.

Appendix A

Status Codes Enterprise Survey (ES): Total

	Senegal
1. Eligible establishment (Correct name and address)	596
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)	10
4. Eligible establishment (Wrong address - the firm/establishment has changed address and the address could be found)	7
16. Panel firm - now less than five employees	1
5. The establishment has less than 5 permanent full time employees	14
6. The firm discontinued businesses	0
7. Not a business: private household	0
8. Ineligible activity: education, agriculture, finances, governments...	12
91. No reply (<i>after having called in different days of the week and in different business hours</i>)	26
92. Line out of order	11
93. No tone	6
94. Phone number does not exist	1
10. Answering machine	0
11. Fax line - data line	0
12. Wrong address/ moved away and could not get the new references	338
616. The firm discontinued business - (Establishment went bankrupt)	8
618. The firm discontinued business - (Original establishment disappeared and is now a different firm)	3
619. The firm discontinued business - (Establishment was bought out by another firm)	2
620. The firm discontinued business - (It was impossible to determine for whatever reason)	51
621. The firm discontinued business - (Other: SPECIFY in COMMENTS)	8
13. Refuses to answer the screener	246
14. In process (<i>the establishment is being called/ is being contacted - previous to ask the screener</i>)	0

151. Out of target - outside the covered regions	1
152. Out of target - moved abroad	0
	1342

Response Outcomes Enterprise (ES) Survey: Total

	Senegal
Sample target	600
Complete interviews (Total)	601
Incomplete interviews	13
Elegible in process	1
Refusals	0
Ineligible	98
Impossible to contact	382
Ineligible - coop.	1
Refusal to the Screener	246
(Screener) in Process	0
	1342

Status Codes Enterprise Survey (ES): Panel

	Senegal
1.Eligible establishment (Correct name and address)	238
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)	3
4. Eligible establishment (Wrong address - the firm/establishment has changed address and the address could be found)	1
16. Panel firm - now less than five employees	0
5. The establishment has less than 5 permanent full time employees	0
6. The firm discontinued businesses	0
7. Not a business: private household	0
8. Ineligible activity: education, agriculture, finances, governments...	11
91. No reply (<i>after having called in different days of the week and in different business hours</i>)	3
92. Line out of order	0
93. No tone	1
94. Phone number does not exist	0
10. Answering machine	0
11. Fax line - data line	0
12. Wrong address/ moved away and could not get the new references	136
616. The firm discontinued business - (Establishment went bankrupt)	4
618. The firm discontinued business - (Original establishment disappeared and is now a different firm)	1
619. The firm discontinued business - (Establishment was bought out by another firm)	0
620. The firm discontinued business - (It was impossible to determine for whatever reason)	22
621. The firm discontinued business - (Other: SPECIFY in COMMENTS)	2
13. Refuses to answer the screener	51
14. In process (<i>the establishment is being called/ is being contacted - previous to ask the screener</i>)	0
151. Out of target - outside the covered regions	0
152. Out of target - moved abroad	0

Response Outcomes Enterprise (ES) Survey: Panel

	Senegal
Sample target	235
Complete interviews (Total)	238
Incomplete interviews	4
Elegible in process	0
Refusals	0
Ineligible	40
Impossible to contact	140
Ineligible - coop.	0
Refusal to the Screener	51
(Screener) in Process	0
	473

Status Codes Enterprise Survey (ES): Fresh

	Senegal
1. Eligible establishment (Correct name and address)	358
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)	7
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	1
5. The establishment has less than 5 permanent full time employees	14
6. The firm discontinued businesses	0
7. Not a business: private household	0
8. Ineligible activity: education, agriculture, finances, governments...	1
91. No reply (<i>after having called in different days of the week and in different business hours</i>)	23
92. Line out of order	11
93. No tone	5
94. Phone number does not exist	1
10. Answering machine	0
11. Fax line - data line	0
12. Wrong address/ moved away and could not get the new references	202
616. The firm discontinued business - (Establishment went bankrupt)	4
618. The firm discontinued business - (Original establishment disappeared and is now a different firm)	2
619. The firm discontinued business - (Establishment was bought out by another firm)	2
620. The firm discontinued business - (It was impossible to determine for whatever reason)	29
621. The firm discontinued business - (Other: SPECIFY in COMMENTS)	6
13. Refuses to answer the screener	195
14. In process (<i>the establishment is being called/ is being contacted - previous to ask the screener</i>)	0
151. Out of target - outside the covered regions	1

152. Out of target - moved abroad	0
	869

Response Outcomes Enterprise (ES) Survey: Fresh

	Senegal
Sample target	365
Complete interviews (Total)	363
Incomplete interviews	9
Elegible in process	1
Refusals	0
Ineligible	58
Impossible to contact	242
Ineligible - coop.	1
Refusal to the Screener	195
(Screener) in Process	17
	886

Appendix B

Universe Senegal: Panel

Source: World Bank Enterprise Survey, 2007

	1 - Food (15)	2 - Other Manufacturing	3 - Retail	4 - Tourism (55 & 63)	5 - Other Services	Grand Total
DAKAR	54	115	66	29	70	334
1-Small	35	83	63	24	54	259
2-Medium	10	22	3	4	14	53
3-Large	9	10		1	2	22
KAOLACK	15	12	9	5	7	48
1-Small	15	12	9	5	7	48
2-Medium						0
3-Large						0
SAINT-LOUIS	7	24	14	3	13	61
1-Small	6	24	13	3	13	59
2-Medium	1		1			2
3-Large						0
THIES	7	25	15	8	8	63
1-Small	5	21	13	8	7	54
2-Medium	2	4	2		1	9
3-Large						0
Grand Total	83	176	104	45	98	506

Universe Senegal: Fresh

Source: Agence Nationale de la Statistique et de la Démographie (ANSD), 2012

	1 - Food (15)	2 - Other Manufacturing	3 - Retail	4 - Tourism (55 & 63)	5 - Other Services	Grand Total
DAKAR	282	410	1701	406	1058	3857
1-Small	170	210	1133	236	682	2431
2-Medium	77	139	428	126	278	1048
3-Large	35	61	140	44	98	378
KAOLACK	15	3	47	1	16	82
1-Small	10	2	29		10	51
2-Medium	4	1	14		3	22
3-Large	1		4	1	3	9
SAINT-LOUIS	9	6	58	30	13	116
1-Small	7	5	40	21	10	83
2-Medium	1		12	7	3	23
3-Large	1	1	6	2		10
THIES	16	9	116	32	52	225
1-Small	11	6	80	17	31	145
2-Medium	3	2	28	9	17	59
3-Large	2	1	8	6	4	21
Grand Total	322	428	1922	469	1139	4280

Appendix C

Strict Cell Weights Senegal: Panel

	Food	Other Manufacturing	Retail	Tourism	Other Services
Dakar					
1 - Small	1.00	1.49		1.50	
2 - Medium	1.09	1.23		1.00	
3 - Large	1.22	1.00			
4 - All sizes combined			1.00		1.00
Kaolack	1.39	1.17	1.07	1.20	1.55
1 - Small	1.39	1.17	1.07	1.20	1.55
2 - Medium					
3 - Large					
4 - All sizes combined					
Saint-Louis	1.29	1.23	1.05	1.00	1.01
1 - Small	1.57	1.23	1.10	1.00	1.01
2 - Medium	1.00		1.00		
3 - Large					
4 - All sizes combined					
Thies	1.62	1.14	1.22	1.04	2.38
1 - Small	1.13	1.29	1.08	1.04	3.77
2 - Medium	2.12	1.00	1.36		1.00
3 - Large					
4 - All sizes combined					

Strict Cell Weights Senegal: Fresh

	Food	Other Manufacturing	Retail	Tourism	Other Services
Dakar					
1 - Small	6.79	5.27		4.15	
2 - Medium	1.18	5.82		1.27	
3 - Large	1.25	1.01		1.24	
4 - All sizes combined			19.40		16.49
Kaolack					
1 - Small	1.20	1.48	3.79		4.20
2 - Medium	1.00		1.14		1.05
3 - Large	1.00		2.30		1.00
4 - All sizes combined					
Saint-Louis					
1 - Small	1.35	1.00	2.80	1.00	1.50
2 - Medium			1.05	2.16	
3 - Large			1.84	1.00	
4 - All sizes combined					
Thies					
1 - Small	1.00	1.00	7.05	1.03	2.56
2 - Medium	1.42	1.00	1.31	1.02	1.00
3 - Large		1.00	1.00	1.00	1.00
4 - All sizes combined					

Median Cell Weights Senegal: Panel

	Food	Other Manufacturing	Retail	Tourism	Other Services
Dakar					
1 - Small	1.15	1.64		1.75	
2 - Medium	1.41	1.50		1.13	
3 - Large	3.02	2.10			
4 - All sizes combined			1.06		1.00
Kaolack	1.34	1.07	1.06	1.16	1.67
1 - Small	1.34	1.07	1.06	1.16	1.67
2 - Medium					
3 - Large					
4 - All sizes combined					
Saint-Louis	1.56	1.56	1.25	1.00	1.53
1 - Small	2.11	1.56	1.51	1.00	1.53
2 - Medium	1.00		1.00		
3 - Large					
4 - All sizes combined					
Thies	1.83	1.16	1.40	1.10	2.73
1 - Small	1.19	1.28	1.17	1.10	4.46
2 - Medium	2.48	1.03	1.63		1.00
3 - Large					
4 - All sizes combined					

Median Cell Weights Senegal: Fresh

	Food	Other Manufacturing	Retail	Tourism	Other Services
Dakar					
1 - Small	9.59	7.25		6.25	
2 - Medium	1.97	9.50		2.26	
3 - Large	2.69	2.11		2.83	
4 - All sizes combined			25.20		21.89
Kaolack	1.08	1.50	2.63		2.13
1 - Small	1.25	1.50	3.45		3.91
2 - Medium	1.00		1.24		1.16
3 - Large	1.00		3.19		1.31
4 - All sizes combined					
Saint-Louis	2.18	1.04	3.23	2.50	2.16
1 - Small	2.18	1.04	3.95	1.67	2.16
2 - Medium			1.76	4.41	
3 - Large			3.97	1.42	
4 - All sizes combined					
Thies	1.58	1.18	3.64	1.58	1.93
1 - Small	1.00	1.09	7.93	1.41	2.94
2 - Medium	2.16	1.44	1.75	1.66	1.16
3 - Large		1.00	1.24	1.66	1.69
4 - All sizes combined					

Weak Cell Weights Senegal: Panel

	Food	Other Manufacturing	Retail	Tourism	Other Services
Dakar					
1 - Small	1.42	2.50		2.38	
2 - Medium	1.48	1.95		1.31	
3 - Large	2.95	2.53			
4 - All sizes combined			2.72		2.26
Kaolack	1.08	1.07	1.32	1.03	1.82
1 - Small	1.08	1.07	1.32	1.03	1.82
2 - Medium					
3 - Large					
4 - All sizes combined					
Saint-Louis	1.80	2.38	1.93	1.24	2.54
1 - Small	2.61	2.38	2.87	1.24	2.54
2 - Medium	1.00		1.00		
3 - Large					
4 - All sizes combined					
Thies	1.56	1.26	1.86	1.14	3.33
1 - Small	1.13	1.50	1.70	1.14	5.67
2 - Medium	1.99	1.02	2.02		1.00
3 - Large					
4 - All sizes combined					

Weak Cell Weights Senegal: Fresh

Fresh-weak

	Food	Other Manufacturing	Retail	Tourism	Other Services
Dakar					
1 - Small	15.13	11.32		9.17	
2 - Medium	3.08	14.68		3.29	
3 - Large	3.86	3.00		3.78	
4 - All sizes combined			42.61		34.63
Kaolack	1.19	1.72	2.90		2.24
1 - Small	1.45	1.72	3.97		4.21
2 - Medium	1.13		1.41		1.24
3 - Large	1.00		3.33		1.28
4 - All sizes combined					
Saint-Louis	3.02	1.42	4.27	3.15	2.79
1 - Small	3.02	1.42	5.44	2.15	2.79
2 - Medium			2.40	5.63	
3 - Large			4.96	1.66	
4 - All sizes combined					
Thies	2.11	1.45	4.81	1.90	2.35
1 - Small	1.35	1.46	10.61	1.76	3.68
2 - Medium	2.88	1.90	2.31	2.06	1.44
3 - Large		1.00	1.51	1.89	1.93
4 - All sizes combined					

Appendix D

Strict Universe Estimates: Panel

	Food	Other Manufacturing	Retail	Tourism	Other Services	Grand Total
Dakar	34	66	23	18	26	167
1 - Small	23	48	0	14	0	84
2 - Medium	8	15	0	3	0	25
3 - Large	4	4	0	1	0	9
4 - All sizes combined	0	0	23	0	26	49
Kaolack	17	12	6	5	5	44
1 - Small	17	12	6	5	5	44
2 - Medium	0	0	0	0	0	0
3 - Large	0	0	0	0	0	0
4 - All sizes combined	0	0	0	0	0	0
Saint-Louis	4	11	5	2	4	27
1 - Small	3	11	4	2	4	25
2 - Medium	1	0	1	0	0	2
3 - Large	0	0	0	0	0	0
4 - All sizes combined	0	0	0	0	0	0
Thies	7	21	9	6	5	47
1 - Small	5	17	8	6	4	39
2 - Medium	2	4	1	0	1	8
3 - Large	0	0	0	0	0	0
4 - All sizes combined	0	0	0	0	0	0
Grand Total	62	110	44	31	39	285

Strict Universe Estimates: Fresh

	Food	Other Manufacturing	Retail	Tourism	Other Services	Grand Total
Dakar	114	167	718	158	478	1635
1 - Small	75	95	0	100	0	269
2 - Medium	28	52	0	44	0	125
3 - Large	11	20	0	14	0	45
4 - All sizes combined	0	0	718	0	478	1196
Kaolack	11	2	34	1	12	61
1 - Small	7	1	23	0	8	40
2 - Medium	3	1	9	0	2	15
3 - Large	1	0	2	1	2	6
4 - All sizes combined	0	0	0	0	0	0
Saint-Louis	5	4	23	11	7	50
1 - Small	3	3	17	8	4	35
2 - Medium	1	0	4	2	3	10
3 - Large	1	1	2	1	0	5
4 - All sizes combined	0	0	0	0	0	0
Thies	11	6	69	16	33	136
1 - Small	8	4	49	9	20	91
2 - Medium	1	1	14	4	11	32
3 - Large	2	1	5	3	2	13
4 - All sizes combined	0	0	0	0	0	0
Grand Total	142	180	844	186	532	1883

Median Universe Estimates: Panel

	Food	Other Manufacturing	Retail	Tourism	Other Services	Grand Total
Dakar	45	79	24	20	26	195
1 - Small	27	52	0	16	0	95
2 - Medium	10	18	0	3	0	31
3 - Large	9	8	0	1	0	18
4 - All sizes combined	0	0	24	0	26	50
Kaolack	16	11	6	5	5	43
1 - Small	16	11	6	5	5	43
2 - Medium	0	0	0	0	0	0
3 - Large	0	0	0	0	0	0
4 - All sizes combined	0	0	0	0	0	0
Saint-Louis	5	14	7	2	6	34
1 - Small	4	14	6	2	6	32
2 - Medium	1	0	1	0	0	2
3 - Large	0	0	0	0	0	0
4 - All sizes combined	0	0	0	0	0	0
Thies	7	21	10	7	5	50
1 - Small	5	17	8	7	4	41
2 - Medium	2	4	2	0	1	9
3 - Large	0	0	0	0	0	0
4 - All sizes combined	0	0	0	0	0	0
Grand Total	74	124	47	33	43	322

Median Universe Estimates: Fresh

	Food	Other Manufacturing	Retail	Tourism	Other Services	Grand Total
Dakar	177	258	932	260	635	2263
1 - Small	105	131	0	150	0	386
2 - Medium	47	86	0	79	0	212
3 - Large	24	42	0	31	0	98
4 - All sizes combined	0	0	932	0	635	1567
Kaolack	11	3	34	1	13	62
1 - Small	7	2	21	0	8	38
2 - Medium	3	1	10	0	2	16
3 - Large	1	0	3	1	3	8
4 - All sizes combined	0	0	0	0	0	0
Saint-Louis	6	4	35	19	9	74
1 - Small	4	3	24	13	6	51
2 - Medium	1	0	7	4	3	15
3 - Large	1	1	4	1	0	7
4 - All sizes combined	0	0	0	0	0	0
Thies	12	7	81	24	40	164
1 - Small	8	4	55	13	24	104
2 - Medium	2	1	19	7	13	42
3 - Large	2	1	6	5	3	18
4 - All sizes combined	0	0	0	0	0	0
Grand Total	207	272	1082	305	697	2562

Weak Universe Estimates: Panel

	Food	Other Manufacturing	Retail	Tourism	Other Services	Grand Total
Dakar	52	113	63	26	59	313
1 - Small	33	80	0	21	0	134
2 - Medium	10	23	0	4	0	38
3 - Large	9	10	0	1	0	20
4 - All sizes combined	0	0	63	0	59	121
Kaolack	13	11	8	4	5	41
1 - Small	13	11	8	4	5	41
2 - Medium	0	0	0	0	0	0
3 - Large	0	0	0	0	0	0
4 - All sizes combined	0	0	0	0	0	0
Saint-Louis	6	21	12	2	10	53
1 - Small	5	21	11	2	10	51
2 - Medium	1	0	1	0	0	2
3 - Large	0	0	0	0	0	0
4 - All sizes combined	0	0	0	0	0	0
Thies	6	24	14	7	7	57
1 - Small	5	19	12	7	6	48
2 - Medium	2	4	2	0	1	9
3 - Large	0	0	0	0	0	0
4 - All sizes combined	0	0	0	0	0	0
Grand Total	78	169	97	40	81	464

Weak Universe Estimates: Fresh

	Food	Other Manufacturing	Retail	Tourism	Other Services	Grand Total
Dakar	275	396	1577	377	1004	3629
1 - Small	166	204	0	220	0	590
2 - Medium	74	132	0	115	0	321
3 - Large	35	60	0	42	0	136
4 - All sizes combined	0	0	1577	0	1004	2581
Kaolack	13	3	38	1	13	69
1 - Small	9	2	24	0	8	43
2 - Medium	3	1	11	0	2	18
3 - Large	1	0	3	1	3	8
4 - All sizes combined	0	0	0	0	0	0
Saint-Louis	8	5	47	25	11	96
1 - Small	6	4	33	17	8	69
2 - Medium	1	0	10	6	3	19
3 - Large	1	1	5	2	0	9
4 - All sizes combined	0	0	0	0	0	0
Thies	16	9	107	30	49	211
1 - Small	11	6	74	16	29	136
2 - Medium	3	2	25	8	16	54
3 - Large	2	1	8	6	4	20
4 - All sizes combined	0	0	0	0	0	0
Grand Total	312	413	1770	432	1078	4004

Appendix E

Original Sample Design, Senegal: Total

	1 - Food (15)	2 - Other Manufacturing	3 - Retail	4 - Tourism (55 & 63)	5 - Other Services	Grand Total
DAKAR	80	93	57	82	68	380
1-Small	37	48	21	31	22	159
2-Medium	31	22	9	39	16	117
3-Large	12	23	27	12	30	104
KAOLACK	21	7	19	4	11	62
1-Small	17	7	10	4	7	45
2-Medium	3	0	8	0	2	13
3-Large	1	0	1	0	2	4
SAINT-LOUIS	5	12	17	12	7	53
1-Small	4	12	11	10	7	44
2-Medium	1	0	5	1	0	7
3-Large	0	0	1	1	0	2
THIES	14	19	27	22	23	105
1-Small	12	15	12	15	9	63
2-Medium	2	3	10	4	12	31
3-Large	0	1	5	3	2	11
Grand Total	120	131	120	120	109	600

Original Sample Design, Senegal: Panel

	1 - Food (15)	2 - Other Manufacturing	3 - Retail	4 - Tourism (55 & 63)	5 - Other Services	Grand Total
Dakar	31	44	23	13	36	147
1-Small	22	30	20	8	20	100
2-Medium	6	11	3	4	14	38
3-Large	3	3	0	1	2	9
Kaolack	12	6	4	4	6	32
1-Small	12	6	4	4	6	32
2-Medium	0	0	0	0	0	0
3-Large	0	0	0	0	0	0
Saint-Louis	3	9	6	2	4	24
1-Small	2	9	5	2	4	22
2-Medium	1	0	1	0	0	2
3-Large	0	0	0	0	0	0
Thies	5	13	6	6	2	32
1-Small	4	11	5	6	1	27
2-Medium	1	2	1	0	1	5
3-Large	0	0	0	0	0	0

Grand Total	51	72	39	25	48	235
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Original Sample Design, Senegal: Fresh

	1 - Food (15)	2 - Other Manufacturing	3 - Retail	4 - Tourism (55 & 63)	5 - Other Services	Grand Total
DAKAR	80	93	57	82	68	380
1-Small	37	48	21	31	22	159
2-Medium	31	22	9	39	16	117
3-Large	12	23	27	12	30	104
KAOLACK	21	7	19	4	11	62
1-Small	17	7	10	4	7	45
2-Medium	3	0	8	0	2	13
3-Large	1	0	1	0	2	4
SAINT-LOUIS	5	12	17	12	7	53
1-Small	4	12	11	10	7	44
2-Medium	1	0	5	1	0	7
3-Large	0	0	1	1	0	2
THIES	14	19	27	22	23	105
1-Small	12	15	12	15	9	63
2-Medium	2	3	10	4	12	31
3-Large	0	1	5	3	2	11
Grand Total	120	131	120	120	109	600

Completed Total Interviews, Senegal:

	1-Food	2-Other Manufacturing	3-Retail	4- Tourism	5-Other Services	Grand Total
Dakar	78	82	55	86	68	369
0-Micro		3	6		2	11
1-Small	46	41	42	50	36	215
2-Medium	22	25	7	33	15	102
3-Large	10	13		3	15	41
Kaolack	23	10	18	4	12	67
0-Micro		2	1		1	4
1-Small	19	7	15	4	10	55
2-Medium	3	1	2			6
3-Large	1				1	2
Saint-Louis	7	12	15	13	5	52
1-Small	7	12	15	12	5	51
2-Medium				1		1
3-Large						
Thiès	18	19	28	23	25	113
0-Micro		1				1
1-Small	13	16	25	15	16	85
2-Medium	4	2	3	7	6	22
3-Large	1			1	3	5
Grand Total	126	123	116	126	110	601

Completed Panel Interviews, Senegal:

ES Achieved - panel

	1-Food	2-Other Manufacturing	3-Retail	4- Tourism	5-Other Services	Grand Total
Dakar	33	47	25	16	21	142
0-Micro		3	6		2	11
1-Small	22	30	17	11	15	95
2-Medium	7	10	2	4	2	25
3-Large	4	4		1	2	11
Kaolack	12	9	8	4	2	35
0-Micro		2	1		1	4
1-Small	9	6	6	4	1	26
2-Medium	2	1	1			4
3-Large	1					1
Saint-Louis	3	8	6	3	3	23
0-Micro						
1-Small	3	8	6	3	3	23

2-Medium						
3-Large						
Thiès	5	16	8	6	3	38
0-Micro		1				1
1-Small	5	13	7	6	1	32
2-Medium		2	1		2	5
3-Large						
Grand Total	53	80	47	29	29	238

Completed Fresh Interviews, Senegal:

ES Achieved - fresh

	1-Food	2-Other Manufacturing	3-Retail	4- Tourism	5-Other Services	Grand Total
Dakar	45	35	30	70	47	227
1-Small	24	11	25	39	21	120
2-Medium	15	15	5	29	13	77
3-Large	6	9		2	13	30
Kaolack	11	1	10		10	32
1-Small	10	1	9		9	29
2-Medium	1		1			2
3-Large					1	1
Saint-Louis	4	4	9	10	2	29
1-Small	4	4	9	9	2	28
2-Medium				1		1
3-Large						
Thiès	13	3	20	17	22	75
1-Small	8	3	18	9	15	53
2-Medium	4		2	7	4	17
3-Large	1			1	3	5
Grand Total	73	43	69	97	81	363

Appendix F

Local Agency team involved in the study:

Local Agency	Name: TNS RMS Senegal Country: Senegal Activities since: 2005
Enumerators involved:	Enumerators: 34 Recruiters: 34
Other staff involved:	Fieldwork Coordinators: 4 Data Entry: None, CAPI was used Data Processing: 6

Sample Frame:

Characteristic of sample frame used:	Fresh: Répertoire National des Entreprises et associations (RNEA) Panel: List from 2007 survey
Source:	Agence Nationale de la Statistique et de la Démographie (ANSD)
Year:	2012
Additional list	None

Sectors included in the Sample:

Original Sectors	Manufacturing Sector which included the following sectors; Food, Other Manufacturing. Services sector which included Tourism, Retail, and Other Services.
Added (top up) Sectors	None

Fieldwork and country situation:

Date of Fieldwork	19 May 2014 – 13 February 2015
Country	Senegal
Use of CAPI	<ul style="list-style-type: none">• Yes
Problems found during fieldwork:	<ul style="list-style-type: none">▪ An important obstacle was the length of the questionnaire. Sometimes, even if an enumerator had an appointment, he received finally a refusal because of the length of the questionnaire.
Country specific situation	<ul style="list-style-type: none">▪ It was difficult to obtain the financial data because of taxes issues that occurs in Senegal. In these cases, respondents were probed to give us estimations.▪ It was difficult to get appointments during holidays period e.g. Eid (Tabaski in Senegal), New Year's time, Magal pilgrimage in Touba etc.