Employer Survey Weighting Procedures Summary
Armenia
October 11, 2013

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1   Survey Design Overview

The following sample design description is based largely on the Armenia team's final implementation report '*Employer Survey Implementation Report – ARMENIA, 2012-2013*' which outlines the sampling plan for the Armenia Employer Survey.

Target Population

The Armenia Employer Survey target population comprises all non-government enterprise workplaces in Yerevan and other urban regions of Armenia. The sampling objective was to obtain interviews from 400 non-government enterprise workplaces in the capital and urban regions of Armenia.

<u>Exclusions</u>

Firms with less than 5 employees were excluded from the target population.

Sample Frame

<u>Source of the frame</u>: A list of taxpayers registered with and provided by the Social Security State Agency from 2012.

<u>Definition of sample frame survey units for each stage of sampling</u>:
First stage unit: Firm
Second stage unit: Workplace (i.e. branch), if applicable.

> Note: The survey results reveal that the sample frame appears to be out-of-date; 478 of the 1065 activated sampled firms, i.e., approximately 45% of the activated sampled firms, are categorized as 'organization non-existent/Firm address could not be found/ ineligible'. Refer to Table 3 on page 5 for the detailed count of interview results.

Sample Design

The Armenia Employer Survey used a stratified two-stage sample design.

<u>Stratification / Sampling</u>

The sample frame of Firms was divided into six strata comprised of (i) two geographic strata, Yerevan and Other Urban; and (ii) 3 size strata, Large - more than 50 employees, Medium – 11 to 50 employees, Small – 5 to 10 employees.

At the first stage of sampling 1078 Firms were selected across the six strata.

At the second sampling stage, after the selection of the 1078 Firms, the Armenia team compiled a list of the Workplaces in the selected Firms and categorized them into the six strata. Then a simple random sample of 1104 Workplaces was selected across the six strata. The Armenia field team attempted to obtain an interview from each selected Workplace.

Table 1 provides the list of strata, the sample frame count of the target population, and the final sample sizes by stratum.

Table 1: Armenia Employer Survey: FIRMS & WORKPLACES - Sample Frame Count & Sample Allocation by Stratum						
STRATUM			Population Size # of Firms [1]	Sample Size # of Sampled Firms [2]	Population Size # of Workplaces [2]	Sample Size # of Sampled Workplaces [2]
No.	Geographic Area	Firm Size				
1	Yerevan	Large	719	154	372	162
2		Medium	2747	241	257	249
3		Small	3416	253	253	253
Sub-Total Yerevan			6882	648	882	664
4	Other Urban	Large	240	127	324	137
5		Medium	1360	140	141	140
6		Small	1928	163	163	163
Sub-Total Other Urban			3528	430	628	440
Grand Total			10410	1078	1510	1104

[1] Source: Document "*Employer frame steps Armenia.w.revisions sent to tania*"
[2] Source: 'STEP_Armenia _Employer Survey_26-Jul-2013 - All Smpl Firms-Brs' - Sample Count from Armenia Data File

2   Data Collection Outcomes

The final survey weights depend on the outcome from the attempt to obtain an interview at each selected Workplace. The treatment of each sampled Workplace in the weighting process depends on the final result code assigned to the sampled Workplace. The interview result codes, i.e., data file variable '**result_code**', used in the Armenia Employer Survey are listed in Table 2; a final '**result_code**' was assigned to each sampled case.

Table 2: Final Result Codes for Sampled Workplaces

Code	Code Description
1	Complete Interview
2	Firm address could not be found
3	Firm non-existent
4	Organization Refusal
5	Not eligible
6	Respondent Refusal
7	Respondent unavailable for survey period
9	Other
95	Non-activated Reserve Sampled Firm

3   Weighting Overview

The Armenia stratified design resulted in differential probabilities of selection for the selected and selected Workplaces. Consequently, each selected Firm and each selected Workplace in the survey does not necessarily represent the same number of Firms nor the same number of Workplaces in the target population. To account for differential probabilities of selection due to the nature of the design and to ensure accurate survey estimates, the Armenia Employer Survey requires a sampling weight for each participating Firm within each stratum and a sampling weight for each participating Workplace within each stratum.

In general, the objectives of the Armenia Employer Survey weighting are to construct a set of survey weights to,
1) compensate for unequal probabilities of selection;
2) compensate for Workplace-level non-response.

The general weighting procedure for the Armenia Employer Survey required the following tasks.

1) Preparation of a data file to input into the weighting process;

2) Weight Calculation:
   a) Calculation of a Firm weight for each sampled Firm;
   b) Calculation of a Workplace weight for each sampled Workplace;
      i) Calculation of a Workplace-level non-response adjustment independently for each stratum.

3) The required output from the weighting process is a final Armenia data file with the final survey weights (i.e., for each sampled Firm and Workplace) appended to each data record.

4   Weighting Process Files

The key file, 'STEP Armenia - Employer Survey - July 26 2013 - All sampled cases', for the weighting process was provided by the WB core team. This file includes all 1104 sampled Workplaces; each Workplace data record includes a Workplace '**result_code**'.

4.1   Revisions to Input Data File

The following revisions were made to the Armenia data file 'STEP Armenia - Employer Survey - July 26 2013 - All sampled cases.dta':

1) **Stratum_code**: Added a stratum identifier, i.e., stratum_code, for each sampled Workplace.

   a) The variable 'stratum_code' was added to the data file 'STEP Armenia - Employer Survey - July 26 2013 - All sampled cases.dta' by merging with the file with the variable 'stratum_code', i.e., 'step_armenia_employer_survey_july_09_2013_all_sampled_cases'. [Note: the 'stratum_code' was assigned by the Armenia team.]
      i) The key variable used to merge the two files was '**firm_code**'.

2) **FIRM_ID** and **BR_ID**: For each <u>participating</u> firm, created the variables 'FIRM_ID', a unique ID for each selected Firm, and 'BR_ID', a unique ID for each selected Branch (i.e., Workplace). These variables were created to show a clear distinction between the first stage Firms and the second stage Workplaces; this facilitates the calculation of the first stage weight and the second stage weight, which is calculated using different formulae than the first stage weight calculation.

   a) The variable 'FIRM_ID' was created by recoding the variable 'firm_code' using the information in the Excel file 'STEP Armenia (english)_Branch sampling info' that was provided by the Armenia team.
      i) Recode specification:
         [RECODE firm_code (556=2001) (678=2002) (680=2003) (705=2004) (707=2005) (708=2006) (710=2007) (712=2008) (714=2009) (675=2010) (688=2011) (704=2012) (722=2013) (723=2014) (1341=2015) (674=2016) (676=2017) (679=2018) (684=2019) (703=2020) (709=2021) (721=2022) (711=2023) (673=2024) (677=2025) (683=2026) (706=2027) (1325=2028) (1327=2028) (1332=2032) (1334=2032) (1354=2032) (1313=2033) (1337=2033) (1349=2033) (800=2034) (696=2036) (729=2036) (743=2036) (1329=2037) (1338=2037) (1345=2037) (1364=2037) (1379=2038) (1385=2038) (1387=2038) (1404=2038) (765=2039) (699 thru 700=2029) (701 thru 702=2030) (689 thru 690=2031) (681 thru 682=2034) (691 thru 693=2035) (685 thru 687=2039) (694 thru 695=2040) (697 thru 698=2040) (ELSE=Copy) INTO FIRM_ID].
   b) The variable 'BR_ID' is equal to the variable 'firm_code'.

3) For each <u>participating</u> firm, added the variable 'n_br', the number of branches (i.e., workplaces) in each participating firm, and 'ns_br', the number of selected branches (i.e., selected workplaces) in each participating firm.

   a) The variables 'n_br' and 'ns_br' were added to the data file 'STEP Armenia - Employer Survey - July 26 2013 - All sampled cases.dta' by merging with the file with the branch variables, i.e., the Excel file 'STEP Armenia (english)_Branch sampling info_OP(22-Jul-2013).
      i) The Excel file 'STEP Armenia (english)_Branch sampling info_OP(22-Jul-2013)' is a revised version of the Excel file 'STEP Armenia (english)_Branch sampling info'. The revisions are simple layout changes in order to satisfy the requirement for matching an Excel file to an SPSS file.

ii)   The key variable used to merge the two files was '**firm_code**'.

b)   The file 'STEP Armenia (english)_Branch sampling info_OP(22-Jul-2013)' only contained branch information for firms with multiple branches; **it was assumed that all remaining participating firms have only one branch, i.e., workplace**.

c)   When the Workplaces were categorized into the six strata at the second sampling stage it resulted in a change of stratum for some workplaces in three firms. Therefore the variable 'ns_br', the number of selected branches (i.e., workplaces), was revised as follows:
   i)   IF (FIRM_ID = 2035 & stratum_code = 1) ns_br=1. [N.B. original ns_br=3]
   ii) IF (FIRM_ID = 2035 & stratum_code = 4) ns_br=2. [N.B. original ns_br=3]
   iii) IF (FIRM_ID = 2039 & stratum_code = 1) ns_br=1. [N.B. original ns_br=4]
   iv) IF (FIRM_ID = 2039 & stratum_code = 4) ns_br=3. [N.B. original ns_br=4]
   v)   IF (FIRM_ID = 2040 & stratum_code = 1) ns_br=1. [N.B. original ns_br=4]
   vi) IF (FIRM_ID = 2040 & stratum_code = 4) ns_br=3. [N.B. original ns_br=4]

4) **SPSS Output File**: 'STEP_Armenia _Employer Survey_26-Jul-2013 - All Smpl Firms-Brs'

a)   This file includes all 1104 sampled cases; each case includes the key weighting variables 'FIRM_ID', 'BR_ID', 'result_code', 'stratum_code', and for each participating firm, the variables 'n_br' and 'ns_br'.

b)   Table 3 provides the breakdown of the 1104 sample cases by '**result_code**' and by Stratum.

c)   This file is the input file for the weighting process.

Table 3:   Armenia Final Sample – Number of Workplaces by Stratum & by Interview Result Code

'result_code'	'stratum_code'						Total
	Yerevan			Other Urban			
	Large	Medium	Small	Large	Medium	Small	
	1	2	3	4	5	6	
1-completed	58	68	55	70	68	65	384
2- Firm address could not be found	11	102	95	4	28	45	285
3-organization non-existent	4	23	39	5	15	16	102
4-organization refusal	45	40	32	41	16	15	189
5-ineligible	13	14	30	10	4	20	91
6-respondent refusal		1	1			1	3
7-respondent unavailable for survey period	1	1	1		5	1	9
9-other				1	1		2
95-not attempted	30			6	3		39
Total	162	249	253	137	140	163	1104

4.2   Final Output File from Weighting Process

The output file from the weighting process is,

1) ARM-W01 Employer Survey-Final Workplace Weights (02-Aug-2013)
    a) This file contains the original data variables from the Armenia data file 'STEP Armenia - Employer Survey - July 26 2013 - All sampled cases' plus the applicable Firm and Workplace weights.
    b) The file contains 1104 data records, of which there are 384 participating Workplaces with a final Workplace weight. The breakdown of the count of participating Workplaces by stratum is shown below in Table 4.

Table 4: Armenia Count of Eligible Participating Workplaces by Stratum	
Stratum	**Participating Eligible Sample Workplaces**
1-Yerevan Large	58
2-Yerevan Medium	68
3-Yerevan Small	55
4-Other Urban Large	70
5- Other Urban Medium	68
6- Other Urban Small	65
Total	**384**

    c) In addition to the Armenia data file variables, the weighted data file includes additional variables that were created during the weighting process. The essential variables that are needed for estimation of survey results are included in the final weighted data file.
        i) Table 5 provides the list of variables, created or revised during the weighting process, which are included in the final weighted data file.
        ii) Table 6 provides the list of other available variables from the weighting process that are not included in the final weighted data file.

Table 5:   Variables Created or Revised During Weighting Process - *Added to Armenia Data File*

Variable Name	Description	Values
result_code	Result Code of Interview – Revised (minor revision to code descriptions)	1-Complete Interview 2-Firm address could not be found 3-Firm non-existent 4-Organization Refusal 5-Not eligible 6-Respondent Refusal 7-Respondent unavailable for survey period 9-Other 95-Non-activated Reserve Sampled Firm
stratum_code	Stratum Identifier	1-Yerevan Large 2-Yerevan Medium 3-Yerevan Small 4-Other Urban Large 5- Other Urban Medium 6- Other Urban Small
FIRM_ID	FIRM_ID #	n/a
BR_ID	Branch_ID #	n/a
n_br	Branches: # in selected Firm	n/a
ns_br	Branches: # selected	n/a
Strat_Fpopn	Stratum Population Size - # of Firms	n/a
Strat_FSmpSz	Stratum Sample Size - # of Sampled Firms	n/a
W1h	FIRM Weight	n/a
Strat_BRpopn	Total # of Branches (i.e., Workplaces) in the selected Stratum Firms	n/a
Strat_BRsmpSz	# of selected Branches (i.e., selected Workplaces) from the selected Stratum Firms	n/a
BR_RespCat	Final Response Category-Workplaces	1-Participant Workplace 2-Ineligible Workplace 3-Non-participant Workplace: Eligible 4-Non-participant Workplace; Unknown Eligibility
W_Finwt	Final Workplace Weight (Participant Workplaces Only); Use for estimation of Workplace characteristics	n/a

Table 6: Variables Created During Weighting Process – Not *Added to Armenia Data File*

Variable Name	Description
B_k	# of participant Workplaces in Stratum
B_x	# of Ineligible Workplaces in Stratum
B_z	# of Non-participant Eligible Workplaces in Stratum
B_u	# of Non-participant Unknown Eligible Workplaces in Stratum
W2h	Basic Workplace Weight (varies by stratum)
Elig_Prop	Proportion of Eligible Workplaces - known eligibility
R_adj	Final Response adjustment ratio for Workplaces (excluding Unknown Eligibility Cases)
W2_BRwt	Stage 2 Workplace Weight: Participant Workplaces Only

5 Weight Calculations

The input file for the process of calculating the weights is 'STEP_Armenia _Employer Survey_26-Jul-2013 - All Smpl Firms-Brs'.

5.1 First Stage: Basic Firm Weight

Based on Armenia's final implementation report "*Skills Toward Employment and Productivity (STEP) Employer Survey Implementation Report – ARMENIA, 2012-2013*", a first stage sample of Firms was selected from each stratum in the stratified "*list of taxpayers registered with the Social Security State Agency from 2012*".

The basic first stage weight for each sampled Firm, calculated independently for each stratum, is based on the probability of selection for each of the Firms.

For the Armenia Employer Survey, the probability of selection of the jth Firm in stratum 'h', say p_{hj}, may be represented as,

1) $$p_{hj} = \frac{n_h}{N_h}$$

where,

n_h - the number of sampled Firms in stratum h,

N_h - the total number of target population Firms in stratum 'h', based on the sample frame information, is represented by

Table 7 provides the sample frame count of the target population and the sample allocation of the number of Firms by stratum.

Table 7:	Armenia Employer Survey: <u>FIRMS</u> - Sample Frame Count & Sample Allocation by Stratum			
STRATUM			**Population Size # of Firms** [1]	**Sample Size # of Sampled Firms** [2]
No.	**Geographic Area**	**Firm Size**	**(N_h)**	**(n_h)**
1		Large	719	154
2	**Yerevan**	Medium	2747	241
3		Small	3416	253
Sub-Total Yerevan			6882	648
4		Large	240	127
5	**Other Urban**	Medium	1360	140
6		Small	1928	163
Sub-Total Other Urban			3528	430
TOTAL			10410	1078

[1] Source: Document "*Employer frame steps Armenia.w.revisions sent to tania*"

[2] Source: Sample Count from Armenia Data File 'STEP_Armenia _Employer Survey_26-Jul-2013 - All Smpl Firms-Brs'

The basic first stage weight, $W1_{hj}$, for the jth Firm in stratum 'h' is calculated as the inverse of its probability of selection:

$$2) \qquad W1_{hj} = \frac{1}{p_{hj}} = \frac{N_h}{n_h}$$

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Example 1: Basic First Stage Weight

The basic first stage weight for each sampled Firm in stratum 1 'Yerevan-Large Firms', which contains 154 sample frame Firms, is calculated as follows:

$$W1_{1j} = \frac{1}{p_{1j}} = \frac{N_1}{n_{1j}} = \frac{719}{154} \approx 4.6689$$

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The basic first stage weight was similarly calculated for each of the sampled Firms.

6   Second Stage: Basic Workplace Weight

Based on Armenia's final implementation report "*Skills Toward Employment and Productivity (STEP) Employer Survey Implementation Report – ARMENIA, 2012-2013*", after the selection of the first stage Firms, the Armenia team verified information for each selected Firm and "*determined if they have branches, and if so, how many branches and the address of each was recorded*". As a result of this verification step the Armenia team "*had a list of firms that included: a) all of the firms without branches and b) all of the branches in urban areas for firms that have branches, so that the list contains all of the workplaces (establishments) identified and each workplace appears only once*". From this list a random sample of Workplaces was selected.

The basic second stage weight for each sampled Workplace, <u>calculated independently for each sampled stratum</u>, is based on the probability of selection of a Workplace from all the workplaces within the sampled Firms in a stratum.

For the Armenia Employer Survey, the probability of selection of the bth Workplace for the hth stratum, say p_{hb} , may be represented as,

3) $$p_{hb} = \frac{m_h}{M_h}$$

where,

m_h - the number of sampled Workplaces in the hth stratum,

M_h - the total number of Workplaces in the hth stratum, based on the sample frame information

Table 8 provides the sample frame count of the target population and the sample allocation of the number of Workplaces by stratum.

Table 8:	Armenia Employer Survey: <u>WORKPLACES</u> - Sample Frame Count & Sample Size by Stratum		Population Size	Sample Size
STRATUM			**Population Size**	**Sample Size**
No.	**Geographic Area**	**Workplace Size**	**# of Workplaces** [1]	**# of Sampled Workplaces** [1]
(h)			*(M_h)*	*(m_h)*
1	Yerevan	Large	372	162
2		Medium	257	249
3		Small	253	253
Sub-Total Yerevan			**882**	**664**
4	Other Urban	Large	324	137
5		Medium	141	140
6		Small	163	163
Sub-Total Other Urban			**628**	**440**
Grand Total			**1510**	**1104**

[1] Source: Sample Count from Armenia Data File 'STEP_Armenia _Employer Survey_26-Jul-2013 - All Smpl Firms-Brs'

The basic second stage weight, W2$_{hb}$, for the bth Workplace in the hth stratum is calculated as the inverse of its probability of selection:

4) $$W2_{hb} = \frac{1}{p_{hb}} = \frac{M_h}{m_h}$$

Example 2: Basic Second Stage Weight

The basic first stage weight for each sampled Workplace in stratum '1-Yerevan Large', which contains 372 Workplaces, is calculated as follows:

$$W2_{1b} = \frac{1}{p_{1b}} = \frac{M_1}{m_1} = \frac{372}{162} \approx 2.296$$

The basic second stage weight was similarly calculated for each of the sampled Workplaces.

6.1   Second Stage Response Adjustment

For treatment in the weighting process the data collection outcomes for the sampled Workplaces may be summarized in four possible categories: participant, ineligible, non-participant with known eligibility, non-participant with unknown eligibility.

1) **Participant** - A participating Workplace '**k**' is an <u>eligible</u> sampled Workplace that provides sufficient data to be considered a participant in the survey. The sampled Workplaces '**k**' with result code '1' satisfy the requirement for classification of the Workplace as a survey participant.

Participant Workplace	Code	Code Description
	1	Complete Interview

2) **Ineligible** – A sampled Workplace '**x**' is categorized as <u>ineligible</u> if it has closed or has less than 5 workers. The result codes for ineligible sampled Workplaces '**x**' are as follows:

Ineligible Workplace	Code	Code Description
	3	Workplace non-existent
	5	Not eligible

3) **Non-participant - Eligibility Known**: A non-participating Workplace '**z**' results when an eligible Workplace does not participate due to refusal or unusual circumstance. The result codes for sampled Workplaces '**z**' with known eligibility are as follows:

Non-Participant Workplace, Eligible	Code	Code Description
	4	Organization (i.e., Workplace) Refusal
	6	Respondent Refusal
	7	Workplace Respondent unavailable for survey period

4) **Non-participant - Eligibility Unknown**: A non-participating Workplace '**u**' results when a Workplace does not participate due to non-contact with the sampled Workplace, inconclusive information about the eligibility status of the sampled Workplace, or a reserve sample case was not activated. The result codes for non-participating Workplaces '**u**' with unknown eligibility are as follows:

Non-Participant Workplace, Unknown Eligibility	Code	Code Description
	2	Workplace address could not be found
	9	Other
	95	Non-activated Sampled Workplace

The total number of sampled Workplaces in stratum 'h' may be represented by the following equation.

$$5) \qquad m_h = m_{hk} + m_{hx} + m_{hz} + m_{hu}$$

where,

m_h -   the number of Workplaces sampled in stratum 'h',
m_{hk} -   the number of Workplaces 'k' in stratum 'h' that participate,
m_{hx} -   the number of ineligible Workplaces 'x' in stratum 'h',
m_{hz} -   the number of non-participating Workplaces 'z' with known eligibility in stratum 'h',
m_{hu} -   the number of non-participating Workplaces 'u' with unknown eligibility in stratum 'h'.

Table 9 provides the stratum counts from the Armenia Employer Survey data file for the outcome categories described above.

Table 9:   Armenia Sample Count of Workplaces by Final Response Category by Stratum

Stratum	Final Response Category - Workplaces				
	1-Participant	2-Ineligible	3-Non-participant Eligible	4-Non-participant Unknown Eligibility	Total
(h)	(m_{hk})	(m_{hx})	(m_{hz})	(m_{hu})	(m_h)
1-Yerevan-Large	58	17	46	41	162
2- Yerevan -Medium	68	37	42	102	249
3- Yerevan -Small	55	69	34	95	253
4-Other Urban-Large	70	15	41	11	137
5-Other Urban -Medium	68	19	21	32	140
6-Other Urban -Small	65	36	17	45	163
Total	384	193	201	326	1104

6.2   Adjustment of Basic Workplace Weights for Unknown Eligibility

The Employer Survey assumes that the Workplaces 'u' with unknown eligibility in stratum 'h' are comprised of some proportion, say ε_h, that are eligible Workplaces and the complementary proportion, $1 - \varepsilon_h$, that are ineligible Workplaces. Note that the calculation of ε_h is carried out independently in each stratum.

Amongst the m_{hu} non-participating Workplaces 'u' with unknown eligibility the proportion of Workplaces with known eligibility is estimated to be

6) $$\varepsilon_h = \frac{Total \ \# \ of \ known \ eligible \ Workplaces}{Total \ \# \ of \ known \ eligible \ \& \ known \ ineligible \ Workplaces} = \frac{m_{hk} + m_{hz}}{m_{hk} + m_{hx} + m_{hz}}$$

➢ **Note that the eligible proportion is the same for all eligible participating Firms in stratum 'h'.**

Example 3: Eligible Proportion

The counts in Table 9 provide input for calculation of the proportion of Firms with known eligibility.

For the Firms in stratum 1, 'Yerevan-Large Firms', the calculation of the eligibility proportion is as follows,

$$\varepsilon_1 = \frac{Total \ \# \ of \ known \ eligible \ cases}{Total \ \# \ of \ known \ eligible \ \& \ known \ ineligible \ cases}$$

$$= \frac{m_{1k} + m_{1z}}{m_{1k} + m_{1x} + m_{1z}}$$

$$= \frac{58 + 46}{58 + 17 + 46} = \frac{104}{121} \approx 0.8595$$

6.3   Adjustment of Basic Workplace Weights for Non-participation

A Workplace-level response adjustment is necessary to compensate for Workplaces that did not participate in the survey.

As stated previously, the total number of sampled Workplaces in stratum 'h' may be represented by the following equation.

$$m_h = m_{hk} + m_{hx} + m_{hz} + m_{hu}$$

where,

m_h -   the number of Workplaces sampled in stratum 'h',

m_{hk} -   the number of Workplaces 'k' in stratum 'h' that participate,

m_{hx} -   the number of ineligible Workplaces 'x' in stratum 'h',

m_{hz} -   the number of non-participating Workplaces 'z' with known eligibility in stratum 'h',

m_{hu} -   the number of non-participating Workplaces 'u' with unknown eligibility in stratum 'h'.

The Workplace-level response adjustment for the hth stratum, R_h, is calculated as follows:

7) $$R_h = \frac{Total\ eligible\ Workplaces\ in\ Stratum\ 'h'}{Total\ particpating\ Workplaces\ in\ Stratum\ 'h'} = \frac{m_{hk} + m_{hz} + (\varepsilon_{hg} * m_{hu})}{m_{hk}}$$

➢   **The response adjustment ratio, R_h, incorporates the adjustment for unknown eligibility, ε_h.**

➢   **The Workplaces that are categorized as ineligible, m_{hx} , are excluded from the calculation of the Workplace-level response adjustment.**

Example 4: Response Adjustment for sampled participating Workplaces

For example, the following results were obtained for Stratum 1

m_h	m_{hk}	m_{hx}	m_{hz}	m_{hu}
162	58	17	46	41

Therefore,

$$R_1 = \frac{Total\ eligible\ Workplaces\ in\ Stratum\ 1}{Total\ particpating\ Workplaces\ in\ Stratum\ 1}$$
$$= \frac{m_{hk} + m_{hz} + (\varepsilon_1 * m_{hu})}{m_{hk}}$$
$$= \frac{58 + 46 + (0.8595 * 41)}{58}$$
$$\approx 2.40068$$

The response adjustment ratio, R_h , is similarly calculated for each stratum.

6.4 Stage 2: Response-adjusted Workplace weight

The stage 2 Workplace weight is an interim weight that is used to calculate the final weight for each participating Workplace.

The stage 2 Workplace weight is calculated as the product of the basic second stage Workplace weight and the response adjustment for the basic second stage Workplace weight. Therefore, for Workplace 'b' in stratum 'h', the stage 2 Workplace weight, $W2\_BRwt_{hb}$, is calculated as follows:

8) $\qquad W2\_BRwt_{hb} = \boldsymbol{W2_{hb} * R_h}$

Example 5: Stage 2 Response Adjusted Weight

For Stratum 1,

$$\boldsymbol{W2\_BRwt_{1b}} = \boldsymbol{W2_{1b} * R_h}$$
$$= 2.2963 \times 2.4007$$
$$\approx 5.5127$$

The stage 2 Workplace weight is similarly calculated for all sampled Workplaces.

7 Final Workplace Weight

The final Workplace weight is the weight used for producing Workplace-level estimates, such as the proportion of Workplaces with a specific attribute. This weight is appended to the Employer Survey data file.

The final Workplace weight is calculated as the product of the basic first stage Firm weight and the response adjusted second stage Workplace weight. Therefore, for Workplace 'b' in stratum 'h', the final Workplace weight, W_Finwt_{hb}, is calculated as follows:

9) $$W\_Finwt_{hb} = \boldsymbol{W1_{hj}} * W2\_BRwt_{hb}$$

➢ **The final Workplace weight is appended to the EMPLOYER SURVEY data file.**

Example 6: Final Firm Weight

For Stratum 1,

$$\boldsymbol{W\_Finwt_{1b}} = \boldsymbol{W2_{1b}} * \boldsymbol{W2\_BRwt_{1b}}$$
$$= 4.6688 \times 5.5127$$
$$\approx 25.7378$$

The final Workplace weight is similarly calculated for all sampled Workplaces.

7.1   Response Rate for Workplaces

The overall Workplace response rate, r_{ARM} , for the Armenia Employer Survey, based on the activated eligible sampled Workplaces, is calculated as follows:

$$10) \qquad r_{ARM} = \frac{\#\ of\ Participating\ Workplaces\ in\ Stratum\ Sample}{\#\ of\ Activated\ Eligible\ Workplaces\ in\ Stratum\ Sample} = \frac{384}{872} = 44.0\%$$

The '**activated eligible**' sampled Workplaces are those in the following categories:

Final Result Codes for Activated Eligible Sampled Workplaces

Code	Code Description
1	Complete Interview
2	Workplace address could not be found
4	Organization Refusal
6	Respondent Refusal
7	Respondent unavailable for survey duration
9	Other

Table 10 provides for each stratum the number of sample cases and the percentage of cases for each interview result code. Note that the interview result codes '3-Non-existent Workplace' and '5-Ineligible' and '95-Non-activated' are excluded from Table 9.

Table 10: Armenia Employer Survey – 'Activated Eligible' Cases, Result Code by Stratum			
Result Code	**Stratum**	**# of Workplaces**	**% of Activated Eligible Workplaces**
1-completed	Yerevan Large	58	6.7%
	Yerevan Medium	68	7.8%
	Yerevan Small	55	6.3%
	Other Urban Large	70	8.0%
	Other Urban Medium	68	7.8%
	Other Urban Small	65	7.5%
	Sub-Total	384	44.0%
2-address could not be found	Yerevan Large	11	1.3%
	Yerevan Medium	102	11.7%
	Yerevan Small	95	10.9%
	Other Urban Large	4	0.5%
	Other Urban Medium	28	3.2%
	Other Urban Small	45	5.2%
	Sub-Total	285	32.7%
4-organization refusal	Yerevan Large	45	5.2%
	Yerevan Medium	40	4.6%
	Yerevan Small	32	3.7%
	Other Urban Large	41	4.7%
	Other Urban Medium	16	1.8%
	Other Urban Small	15	1.7%
	Sub-Total	189	21.7%

Table 10: Armenia Employer Survey – 'Activated Eligible' Cases, Result Code by Stratum			
Result Code	Stratum	# of Workplaces	% of Activated Eligible Workplaces
6-respondent refusal	Yerevan Medium	1	0.1%
	Yerevan Small	1	0.1%
	Other Urban Small	1	0.1%
	Sub-Total	3	0.3%
7-respondent unavailable for survey period	Yerevan Large	1	0.1%
	Yerevan Medium	1	0.1%
	Yerevan Small	1	0.1%
	Other Urban Medium	5	0.6%
	Other Urban Small	1	0.1%
	Sub-Total	9	1.0%
9-other	Other Urban Large	1	0.1%
	Other Urban Medium	1	0.1%
	Sub-Total	2	0.2%
Grand Total	Yerevan Large	115	13.2%
	Yerevan Medium	212	24.3%
	Yerevan Small	184	21.1%
	Other Urban Large	116	13.3%
	Other Urban Medium	118	13.5%
	Other Urban Small	127	14.6%
	Grand Total	872	100.0%

7.2 Weighted Workplace Counts

The numbers of Workplaces on the stage 2 sample frame includes Workplaces that no longer existed at the time of the Employer Survey, e.g. closed Workplaces, ineligible Workplaces.

The total <u>weighted</u> number of Workplaces by stratum is provided in Table 11.

Table 11:	Table 12: Armenia Weighted Number of Eligible Participating Workplaces by Stratum				
Stratum	**Stage 1**	**Stage 2**		**Participating Eligible Workplaces in Sample**	**Weighted Number of Workplaces in Target Population**
	Sample Frame	**Sample Frame**	**# of**		
	# of Firms	**# of Workplaces in Sampled Firms**	**Selected Workplaces**		
	(1)	(2)	(3)	(4)	(5)
1-Yerevan-Large	719	372	162	58	**1,493**
2-Yerevan-Medium	2,747	257	249	68	**2,192**
3-Yerevan-Small	3,416	253	253	55	**1,924**
4-Other Urban-Large	240	324	137	70	**539**
5-Other Urban-Medium	1,360	141	140	68	**1,129**
6-Other Urban-Small	1,928	163	163	65	**1,340**
Total	10,410	**1,510**	**1,104**	**384**	**8,617**

Notes for Table 10
1. For column 1, the 'Number of Firms' is an un-weighted total; it is the actual total number of Firms for all strata in the sample frame.
2. For column 5, the decrease in the weighted number of Workplaces is attributable to the adjustment of the basic stratum Workplace weights for <u>ineligible</u> Workplaces found in the Employer Survey sample.
3. *The 'Weighted Number of Workplaces' in column 5 provides the survey estimate of the number of Workplaces by stratum in the target population.*