

Sample Size Determination for the Labor Turnover Survey 2008

Specifying the Tolerable Error:

The margin of error (e) was fixed at 3%. The level of significance or the probability that the estimated proportion of employed persons is within 3% of the population proportion was specified as 95%, that is, setting $\alpha = 0.05$. The desired precision for the surveys can be expressed as follows:

$$P(|p - P| \leq e) = 1 - \alpha$$

$$P(|p - P| \leq 0.03) = 1 - 0.05,$$

$$P(|p - P| \leq 0.03) = 0.95$$

where

p - is the sample proportion and

P - is the population proportion.

To compute for the initial sample size without replacement n_0 , we use the following formula:

$$n_0 = \frac{z_{\alpha/2}^2 S^2}{e^2}.$$

For large populations, $S^2 \approx p(1-p)$ or $S^2 \approx pq$ while, the sample proportion was set to 0.5 (the most conservative value of proportion). Now, computing for the initial sample size, we have:

$$\begin{aligned} n_0 &= \frac{z_{\alpha/2}^2 S^2}{e^2} \\ &= \frac{1.96^2 (0.5 \times 0.5)}{0.03^2} \\ n_0 &= 1,067 \end{aligned}$$

For **LTS 2008**, the population size is equal to 3,076. Since the proportion of the initial sample size to the population size is not negligible, we obtain a revised estimate of the sample size taking into account the finite population correction (**fpc**):

$$\begin{aligned} n &= \frac{N n_0}{N + n_0} \\ &= \frac{3,076 \times 1,067}{3,076 + 1,067} \\ n &= 792.20178 \\ n &\approx 793 \end{aligned}$$

To ensure the precision of estimates in each domain, initial sample size is allocated in each domain using Kish's allocation formula utilizing the proportion of establishments with hard-to-fill occupation culled from the 2006 BITS results.

TABLE 1 - Distribution of Total Establishments and Number of Samples Per Stratum Allocated Using Kish Allocation Formula by Major Industry Group for 1st Quarter 2008 LTS, Philippines

Major Industry (Domain)	Proportion of Establishments with hard-to-fill occupations p	Variance of the proportion $v(p) = pq$	Number of Population Units (2008 LTS) N_h	$n_h = n \left(\frac{\sqrt{\frac{1}{L^2} + IW_h^2}}{\sum_{h=1}^L \sqrt{\frac{1}{L^2} + IW_h^2}} \right)$	adjusted n_h	adjusted n_h nr=3.1%; inelig=7.0%
Philippines	0.2	0.1768	3,076	793	669	737
Agriculture, Hunting and Forestry	0.5 ^a	0.2500	18	41	18	18
Fishing	0.5 ^a	0.2500	5	41	5	5
Mining and Quarrying	0.4	0.2406	26	41	26	26
Manufacturing	0.3	0.1998	719	103	103	116
Electricity, Gas and Water	0.2	0.1445	29	41	29	29
Construction	0.2	0.1353	150	45	45	50
Wholesale and Retail Trade	0.2	0.1535	1,054	144	144	163
Hotels and Restaurants	0.2	0.1501	94	43	43	48
Transport, Storage and Communications	0.2	0.1521	180	47	47	52
Financial Intermediation	0.2	0.1691	229	51	51	58
Real Estate, Renting and Business Services	0.3	0.1914	457	73	73	82
Private Education Services	0.2	0.1844	21	41	21	21
Health and Social Services	0.5	0.2478	22	41	22	22
Other Community, Social and Personal Services	0.2	0.1389	72	42	42	47

a Proportion was not culled from the results of 2006 BITS because BITS cover only non-agricultural establishments. The proportion was arbitrarily set at 0.5 as this will give the maximum number of samples.