

Minnesota Manufacturing Business Conditions Survey Methodology

The Minnesota Directory of Manufacturers provided the population of 9,973 manufacturing businesses for the survey. Businesses were categorized on three dimensions: 1) Type of goods manufactured (i.e., durable vs. non-durable); 2) Location in Minnesota (i.e., Seven-county Twin Cities metro area vs. Greater Minnesota); and 3) Size (i.e., small with less than 50 employees, medium with 50 to 249 employees and large with 250 or more employees). These categories created 12 groups of manufacturers where independent, random samples were taken.

Since 80 percent of all manufacturing businesses are small (less than 50 employees), it is very likely that a simple random sample would draw mostly small businesses and very few large businesses. Yet, 52 percent of manufacturing jobs are provided by the few large businesses, compared to only 17 percent of jobs provided by all small businesses. Hence, stratified random sampling was utilized, by drawing independent samples from each of the 12 groups. An example of a sample group is durable goods manufacturers in Greater Minnesota with 50 to 249 employees. Up to 330 businesses were randomly picked from each group, with all businesses selected from five groups containing fewer than 330 businesses -- groups of large and medium-sized businesses. The total number of businesses selected for the samples was 2,951.

Two mailings of a post card survey were sent to each of the selected businesses. The first mailing was on July 20th and the second mailing went out to businesses that had not respond by August 3rd. The cutoff for survey responses was August 20th. A total of 1053 usable surveys were received, for a response rate of 36 percent. Response rates for the different sample groups ranged from 27 percent to 45 percent. Of the usable surveys, 154 were from respondents indicating that their specific location had no manufacturing on site. An additional 116 surveys were returned as undeliverable or were unusable.

Survey results were tabulated for all manufacturers and for seven groups of manufacturers. The seven groups reflect the three dimensions of type of goods manufactured, location and business size. Two sets of results reflect: 1) Results representative of manufacturing businesses, where each business in the population was considered equally; and 2) Results representative of employment at Minnesota's manufacturing businesses. Weighting for the first set of results simply re-balanced the results to account for the stratified sampling. These results are reflective of Minnesota's manufacturing businesses, with each business being considered as an equal to all others.

Weighting for the second set of results was based on employment at the respondent's site. Small, medium and large businesses were weighted according to their size group's representation of employment among Minnesota's manufacturers. For example, while large businesses accounted for a total of only four percent of the weight in the first set of results (i.e., business weights), they account for 52 percent of the weight in the second set of results (i.e., employment weights). These results are more reflective of Minnesota's overall manufacturing business conditions.

Confidence intervals for sampling error were calculated for results presented in each of the eight tables, and were rounded to the nearest whole percent. The 95 percent confidence interval for the table of results for all manufacturers is plus or minus 3 percentage points. Confidence intervals for results in all other tables are greater, since they are based on sub-groups of the 899 total respondents and smaller sample groups are subject to greater sampling error. Results are also subject to errors introduced by other factors such as the wording of questions and differences between survey respondents and non-respondents.