Regular Examination of the Statistical Accuracy of the *Tankan*

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Bank of Japan

The Bank of Japan examines the statistical accuracy of the *Tankan* (Short-Term Economic Survey of Enterprises in Japan) regularly (once a year in principle), to prevent the lowering of statistical accuracy due to a decrease in the number of sample enterprises resulting from bankruptcies, mergers, and other factors. When the accuracy is not sufficient, the Bank adds new sample enterprises. The recent examination showed that the statistical accuracy after the December 2019 survey satisfied the criteria. The total number of the sample enterprises for the March 2020 survey will be 9,859 (including 206 financial institutions).

Note: For details of the statistical accuracy of the *Tankan*, please refer to "Explanation of the *Tankan* (Short-Term Economic Survey of Enterprises in Japan)," February 2019.

Details of the examination are as follows.

1. Sample Distribution

In the *Tankan*, the population is determined as private enterprises with capital of 20 million yen or more (excluding financial institutions). The population is classified into 389 strata by industry, enterprise size and sales for the estimation of the population total.[1] The Bank examined whether there is a statistically significant difference in these strata between the sample and population distributions.[2] The result showed that there was no stratum in which the sample distribution was deemed to deviate from the population distribution.[3]

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[1] In the *Tankan*, the Bank places the restriction on selecting sample enterprises in order to limit disturbance to the estimates due to an idiosyncratic factor of a sample enterprise: the sampling ratio of each stratum is maintained at 0.5 percent or more. The Bank verified that there was no stratum with sampling ratio of less than 0.5%, along with the examination of the statistical accuracy on the above.

[2] The "test of the goodness of fit" using chi-square distribution is used in the regular examination. This method tests the null hypothesis, H_0: "There is no significant difference between the sample and population distributions." When the hypothesis is statistically rejected, the sample distributions are deemed to deviate from the population distributions.

[3] In the Survey of Financial Institutions, the population is determined as financial institutions with 10 employees or more. The population is classified into 23 strata by sector and the number of employees. The Bank examined whether there is a statistically significant difference in these strata

2. Standard Error Ratios

The Bank examined the standard error ratio of sales[4] in manufacturing and nonmanufacturing for each enterprise size in the *Tankan*. The results showed that the standard error ratios remained within the criteria — 3% or less for manufacturing and 5% or less for nonmanufacturing — as listed in the table below.[5]

Standard Error Ratios of Sales

		Large Enterprises	Medium-Sized Enterprises	Small Enterprises
Manufacturing	Actual	0.7%	1.8%	1.8%
	Criterion	3.0% or less		
Nonmanufacturing	Actual	1.2%	2.2%	1.7%
	Criterion	5.0% or less		

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between the sample and population distributions. The result showed that there was no stratum in which the sample distribution was deemed to deviate from the population distribution.

[4] Standard error ratio shows how accurate an estimate of the survey population mean is. It is calculated by dividing the standard deviation of the sample mean by the survey population mean.

[5] In the Survey of Financial Institutions, the Bank examines the standard error ratio of fixed and software investment (excluding land purchasing expenses) for overall financial institutions. The result showed that the standard error ratio was 6.3%, remaining within the criterion, 10%.