Appendix 3
Sampling Establishments, Estimation Method of Results
and Sampling Error of the Estimates

1　Sampling Establishments

The population of "the Monthly Survey on Service Industries" is based on the 2009 Economic Census for Business Frame[*1]. As shown below, the survey covers establishments, and enterprises, etc. selected using a statistical method from the country's establishments and enterprises, etc. mainly engaging in the industries listed in (1).

- Monthly survey　Establishment ; Approximately 26,000

　　　　　　　　　Enterprise, etc.; Approximately 13,000

- Annual survey　Establishment ; Approximately 67,000

　　　　　　　　　Enterprise, etc.; Approximately 9,500

(1)　Coverage of the Survey

The survey covers industries classified in groups designated by the Japan Standard Industrial Classification (Rev.12, November 2007) as shown below.

- "G Information and communications"
- "H Transport and postal activities"
- "K Real estate and goods rental and leasing"
- "L Scientific research, professional and technical services"
  - *Excluding the medium group "71 Scientific and development research institutes"　and the detailed category "7282 Pure holding companies"
- "M Accommodations, eating and drinking services"
- "N Living-related and personal services and amusement services"
  - *Excluding the minor group "792 Domestic services"
- "O Education, learning support"
  - *Excluding the medium group "81 School education"
- "P Medical, health care and welfare"
  - *Excluding the minor group "841 Public health centers", "851 Social insurance organizations" and "852 Welfare offices"
- "L Services, n.e.c. "
  - * Excluding the medium group "93 Political, business and cultural organizations", "94 Religion" and "96 Foreign governments and international agencies in Japan"

** Establishments belonging to the minor group "Establishments engaging in administration, ancillary economic activities" prepared in each medium group are excluded.

(2) Sampling and Replacing Establishments

   A. Enterprise, etc. (the census survey group (complete census))

   (a)   The survey is conducted on enterprises, etc. belonging to the industries that do not fit a survey by sampling establishments, such as the minor group "371 Fixed telecommunications," "372 Mobile telecommunications" and "382 Private-sector broadcasting except cablecasting" and the medium group "42 Railway transport," "46 Air transport" or "49 Postal activities including mail delivery service."

   (b)   The survey is conducted on all enterprises belonging to the industries other than above A, with capital, investment, or fund of 100 million yen or more.

   B. Establishment (the census or sample survey group)

   Samples are selected by stratified random samples for group based of number of persons working at the location of establishment for establishments which belong to the industries other than above A and do not belong to enterprise, etc. falling under the above (a) or (b). For sampling establishments, all establishments in the stratum above a certain scale are surveyed.

   Establishments extracted by sampling are in principle surveyed for two consecutive years and are replaced once in two years based on the perspective to stabilize the survey results and to enhance the precision of the statistical results such as the year-on-year comparison by month. The subjects of the census survey group are surveyed on a continuing basis without being replaced.

   *1   The establishments and enterprises, etc. are extracted based on the 2009 Economic Census for Business Frame. Based on various information collected in the subsequent years, establishments and enterprises, etc. newly established after the implementation of the 2009 Economic Census for Business Frame were also added to the population to implement appropriate sampling. When an establishment closes down, a replacement establishment is selected and added to the subjects of the survey.

   *2   Since a similar annual survey is implemented for "G Information and communications," this group is not included in the annual survey (expanded survey). (The monthly survey includes this group)

2   Estimation Method of Results

   Sales and the number of persons working at the location of establishment are calculated as described below. As for the survey item "Demand situation" of the monthly survey, figures are calculated based on the responses from the subjects without restoring and estimating the results: calculations for enterprises, etc. are made for each business activity, and calculations for establishments are made for each establishment.

   (1) Enterprise, etc.

   Enterprise, etc. is calculated with a weight of 1, and calculates numbers for enterprise, etc. sales, number of persons working at the location of establishment.

(2) Establishment

・Census survey group

　　Census survey group is calculated with a weight of 1, and calculates numbers for establishment sales, number of persons working at the location of establishment.

・ Sample survey group

　　Sample survey group is calculated with a weight inverse to the number of the sampling ratio in each industry and group of establishment size according to the number of persons working at the location of establishment.

(3) Handling of Missing Values

　When there are missing values for establishments and enterprises, etc. due to various reasons including delay in returning the questionnaire, calculation is made by the result figures with the estimated value by multiplying the rate of change from the previous result or by using figures from data disclosed by the relevant subject.

3　Sampling Error of the Estimates

　Sampling errors for sales are estimated by the following formula. The results can be seen in the table. The estimated values of sampling errors are calculated by the number of persons working at the location of establishment categorized by industry.

The standard error rate (%)

$$= \text{Standard error of the total value} \div \text{Total sales of the population} \times 100$$

$$\text{The standard error of the total value} = \sigma_x \approx \sqrt{\sum_{i=1}^{L} N_i(N_i - n_i)\frac{s_i^2}{n_i}}$$

N_i ： The number of population establishments in i stratum

n_i ： The number of sample establishments in i stratum

L ： The number of the stratum

　　　(Size of persons working at the location of establishment)

s_i^2 ： Sample variance for sales in i stratum

$$s_i^2 = \frac{1}{n_i - 1}\sum_{j=1}^{n_i}(x_{ij} - \bar{x}_i)^2 = \frac{1}{n_i - 1}\left(\sum_{j=1}^{n_i} x_{ij}^2 - n_i \bar{x}_i^2\right)$$

x_{ij} ： Sales of jth sample in i stratum

$\bar{x}_i$ ： Average sample sales in i stratum

Table Sampling Error for Monthly Sales of the Estimates by Industry

(%)

Industry (medium groups)	2014											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Service industry	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
G　Information and communications	1.0	1.0	1.2	1.0	0.9	0.9	1.0	0.9	0.9	0.9	1.0	1.0
37　Communications	0.4	0.3	0.6	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4
38　Broadcasting	0.3	0.3	0.3	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
39　Information services	2.4	2.2	2.2	2.4	2.3	1.9	2.4	2.3	1.8	2.3	2.5	2.1
40　Internet based services	1.6	2.0	2.5	1.6	1.1	1.2	1.2	1.4	1.5	1.7	1.6	1.5
41　Video picture, sound information, character information production and distribution	3.7	3.1	3.6	3.2	2.7	2.7	2.3	2.5	2.7	2.5	3.2	2.9
H　Transport and postal activities	1.8	1.9	1.8	1.9	1.9	1.9	1.9	1.7	1.8	1.9	1.9	1.8
42　Railway transport	-	-	-	-	-	-	-	-	-	-	-	-
43　Road passenger transport	2.1	2.1	2.0	2.1	2.0	2.1	2.1	2.0	2.1	2.1	2.0	2.1
44　Road freight transport	4.2	4.3	4.1	4.3	4.4	4.3	4.3	4.1	4.3	4.3	4.2	4.2
45　Water transport	1.6	1.8	1.8	1.8	1.8	1.7	1.9	2.0	1.9	1.9	1.9	1.8
47　Warehousing	3.6	3.6	3.5	3.7	3.6	3.6	3.7	3.6	3.7	3.7	3.7	3.8
48　Services incidental to transport	4.2	4.3	4.3	4.5	4.3	4.2	3.9	4.1	4.4	4.8	4.9	4.3
4*　Air transport, postal activities, including mail delivery	-	-	-	-	-	-	-	-	-	-	-	4*
K　Real estate and goods rental and leasing	2.4	2.2	2.0	2.3	2.2	2.5	2.5	2.0	2.3	2.4	2.4	2.4
68　Real estate agencies	5.3	4.0	3.2	4.4	4.5	5.4	5.5	3.4	4.7	6.0	5.3	5.3
69　Real estate lessors and managers	3.7	3.7	3.4	3.9	3.6	3.5	3.9	3.6	3.7	3.6	3.6	3.7
70　Goods rental and leasing	3.4	3.5	3.8	3.2	3.2	3.5	3.2	3.3	3.4	3.2	3.3	3.5
L　Scientific research, professional and technical services　1)	2.3	2.2	2.0	3.3	2.6	1.8	2.1	2.2	1.9	2.1	1.9	1.6
72　Professional services, n.e.c.　2)	3.3	3.0	3.8	5.7	2.7	2.8	4.1	2.8	3.5	3.5	2.8	2.8
73　Advertising	2.9	2.6	2.3	2.6	2.6	2.5	2.6	2.4	2.4	2.8	2.6	2.2
74　Technical services, n.e.c.	5.0	4.4	3.3	6.8	5.6	3.3	3.8	4.7	3.4	4.2	3.9	3.0
M　Accommodations, eating and drinking services	1.6	1.7	1.9	2.0	1.9	1.8	1.8	1.9	1.9	2.0	2.1	1.7
75　Accommodations	4.5	5.8	6.7	7.2	6.4	6.1	5.7	5.7	6.4	6.8	7.1	5.7
76　Eating and drinking places	1.9	1.8	1.8	1.9	1.8	1.8	1.7	1.8	1.8	1.8	2.0	1.8
77　Food take out and delivery services	3.0	3.2	2.7	3.1	3.2	3.2	3.1	3.2	3.4	3.3	3.3	3.2
N　Living-related and personal services and amusement services	1.9	1.9	1.8	2.0	1.9	1.9	2.0	2.0	1.9	1.9	1.8	1.9
78　Laundry, beauty and bath services	3.3	3.5	3.5	3.2	3.3	3.4	3.2	3.2	3.7	3.3	3.3	3.3
79　Miscellaneous living-related and personal services　3)	2.4	2.7	2.5	2.7	2.7	2.5	2.6	2.5	2.5	2.6	2.5	2.6
80　Services for amusement and hobbies	2.5	2.5	2.4	2.7	2.6	2.6	2.7	2.7	2.7	2.6	2.6	2.6
O　Education, learning support　4)	5.0	4.5	5.3	4.3	4.5	4.8	5.2	3.8	4.1	4.5	4.6	4.7
82　Miscellaneous education, learning support	5.0	4.5	5.3	4.3	4.5	4.8	5.2	3.8	4.1	4.5	4.6	4.7
P　Medical, health care and welfare	1.4	1.3	1.3	1.3	1.4	1.3	1.4	1.3	1.3	1.6	1.3	1.3
83　Medical and other health services	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.1
84　Public health and hygiene　5)	8.1	7.9	9.9	7.7	7.5	7.6	7.8	8.3	8.0	7.7	7.5	7.6
85　Social insurance and social welfare　6)	5.6	5.0	5.1	4.9	5.6	5.0	5.7	4.9	5.0	6.1	5.0	4.9
R　Services, n.e.c.　7)	3.1	3.0	3.0	3.1	3.1	3.1	3.2	3.2	3.0	3.2	3.0	3.1
88　Waste disposal business	5.5	5.7	5.9	5.8	6.0	5.9	5.7	5.8	5.9	5.8	5.8	5.7
89　Automobile maintenance services	6.7	6.4	7.5	7.2	8.0	10.7	9.8	8.0	8.4	10.2	8.4	7.8
90　Machine, etc. repair services, except otherwise classified	4.8	4.9	6.1	4.5	4.9	5.3	4.8	4.7	5.7	4.6	5.4	5.0
91　Employment and worker dispatching services	3.1	3.2	3.1	3.0	3.1	3.1	3.2	3.2	3.2	3.2	3.2	3.3
92　Miscellaneous business services	5.5	5.4	5.3	5.6	5.5	5.5	5.7	5.6	5.3	5.7	5.2	5.4
95　Miscellaneous services	23.3	25.3	24.0	25.3	25.2	23.6	25.0	22.9	23.6	24.4	24.8	27.1

Note) For the census survey group, Sampling Error was calculated as 0.

1) Excluding ″scientific and development research institutes″ 2) Excluding ″pure holding companies″ 3) Excluding ″domestic services″ 4) Excluding ″school education″ 5) Excluding ″public health centers″

6) Excluding ″social insurance organizations″ and ″welfare offices″ 7) Excluding ″political, business and cultural organizations″, ″religion″ and ″foreign governments and international agencies in Japan″