## Revisions to the Tankan survey

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1. What is "Tankan"?

2. Strengths of the Tankan

3. Characteristics and Peculiarities of Data

4. Revisions to the Tankan

## 0. Index

1. What is "Tankan"?

### 2. Strengths of the Tankan

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### "Tankan": Short-Term Economic Survey of Enterprises in Japan

#### Purpose

- Provides an accurate picture of business trends of enterprises in Japan
  Contribute to the appropriate implementation of monetary policy
  - Conducted in accordance with the Japanese Statistics Law (No obligation)

#### **Survey Method and Frequency**

- By mail or online
- Quarterly (March, June, September, December)

#### **Coverage and Sample Maintenance**

- 10,882 sample enterprises out of about 210 thousand population\* enterprises (Sep.2017) with a capital of 20 million yen or more.
- Tankan is basically a <u>panel-structure</u> survey.
  - -- New samples are added when statistical accuracy declines.
  - -- Samples are revised when population of the survey is updated.

\*: Population of the survey taken from "Economic Census for Business Activity" (Ministry of Internal Affairs and Communications)

#### **Classification by Industry and Size**

- **31** industries
  - $\Rightarrow$  17 categories for manufacturing
  - $\Rightarrow$  14 categories for nonmanufacturing
  - 3 sizes based on the amount of capital
    - $\Rightarrow$  Small (Capital: 20 million yen ~ 100 million yen)
    - $\Rightarrow$  Medium-sized (Capital: 100 million ~ 1 billion yen)
    - $\Rightarrow$  Large (Capital: 1 billion yen ~)

#### **Survey Items**

- Judgment survey (13 items)
- Quantitative data (10 items)
- Inflation outlook (2 items)

### 2. Strengths of the Tankan

### 3. Characteristics and Peculiarities of Data

### 4. Revisions to the Tankan

# 2. Strengths of the Tankan

#### I. High response rate

**99.4%** (Sept. 2017)

 $\rightarrow$  maintained a high response rate (95.6%) even after the Great East Japan Earthquake (Mar. 2011)

■ <u>Maintaining low rates of non-sampling errors</u> such as missing values

 $\rightarrow$  (will be explained in detail later)

- **II. Long history** 
  - The Tankan's predecessor started in 1957 based on IFO's survey.
  - The present Tankan started in 1974. 174<sup>th</sup> survey completed in Sept. 2017.

#### **III. Statistical accuracy**

- Stratified sampling to reduce sampling error.
- Regular revision of the sample enterprises.



# 2. Strengths of the Tankan

#### **IV. Quick release**

- Response collected in one month.
- Results released on the day after the end of the survey period.

#### V. Various survey items

- Judgment survey (13 items)
- Quantitative data (10 items)
- Inflation outlook (2 items)



#### Historical Response Rate

#### **99.1%** (Average from Mar. 2009 to Sept. 2017)



#### **Response Rates of Major Business Surveys in Japan**

	TANKAN	Business Outlook Survey	Quarterly Survey on Trends of Small and Minute Enterprises <small enterprises<br="">Part&gt;</small>	Quarterly Survey on Trends of Small and Minute Enterprises <minute enterprises<br="">Part&gt;</minute>	Survey on Planned Capital Spending
Survey Period	Sept. 2017	Sept. 2017	July,	2017	June, 2017
Institution	Bank of Japan	Cabinet Office	Japan Finance	Japan Finance Corporation	
Coverage	Private enterprises with at least 20 million yen in capital	Enterprises with at least 10 million yen in capital	Client comp	anies of JFC	All private companies in Japan with at least a billion yen in capital, excluding finance, insurance, etc.
Number of Sample Enterprises	10,687	15,952	13,878	10,000	3,127
Response rate	99.4%	82.5%	50.7%	64.2%	65.0%

#### Response Rates of Overseas Business Surveys

	TANKAN	Business and Consumer Survey (Industry)			Business Conditions Survey for the Manufacturing Industries
Survey Period	Sept. 2017	2016	June, 2016	April, 2016	Jan. 2008
Institution	Bank of Japan	Germany: IFO	France: INSEE	United Kingdom: Confederation of British Industry	Canada: Statistics Canada
Sample size	10,687	3,000	4,000	2,096	9,000
Response rate	99.4%	~75.0%	75.0%	about 25.0%	45.0%

Sources: ECB, Statistics Canada, BOJ

#### Approach to Collecting Survey Responses





#### **Reducing Reporting Burden**

#### Abolishing items whose reporting burden exceeds its value as a statistics

e.g. Personnel Expenses, Depreciation Expenses, and P/L related items etc...

Respondent-friendly descriptive documents enclosed with the survey form



## 2. Reasons for Continuously High Response Rate



### 2. Strengths of the Tankan

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#### **Difficulty in interpreting the Tankan**

#### ■ All statistics have their "peculiarities"

 $\rightarrow$  Certain patterns which are not related to the economic conditions of the time

#### ■ Why the peculiarities occur?

 $\rightarrow$  Due to psychology of the respondents and factors attributed to the industry groups or size of the enterprises

#### ■ How to deal with the peculiarities

- $\rightarrow$  Should we revise the framework of the Tankan?
- → No (The continuity of its time-series data may be undermined and may create new peculiarities)

We need to deepen the understanding of the characteristics and statistical peculiarities for more accurate interpretation of data.

Business Conditions		
Domestic Supply and Demand Conditions for Products and Services		
Overseas Supply and Demand Conditions for Products		
Inventory Level of Finished Goods and Merchandise		
Wholesalers' Inventory Level		
Production Capacity		
Employment Conditions		
Financial Position		
Lending Attitude of Financial institutions		
Change in Interest Rate on Loans		
Conditions for CP Insurance		
Change in Output Prices		
Change in Input Prices		
Sales		
Exports		
Exchange rates for Exports		
Operating Profits		
Current Profits		
Net Income		
Fixed Investment		
Land Purchasing Expenses		
Software Investment		
R&D Investment		
Outlook for Output Prices		
Outlook for General Prices		



Highly linked to the latest trend in the business cycle

 $\Rightarrow$ Business Conditions D.I. captures the turning points of the economy.

Business Conditions D.I. (forecast) does not always forecast the actual result D.I. in next survey due to unexpected developments of the situation.

#### Gap of Business Conditions D.I. (Large Manufacturing Enterprises) between "Actual result" in present survey and "Forecast" in previous survey



Business Conditions D.I. (forecast) is bearish when the economy is expanding, bullish when the economy is contracting.

#### **Gap of Business Conditions D.I.** (Large Retailing Enterprises) **between "Actual result" in present survey and "Forecast" in previous survey**



• Large enterprises in the retailing industry tend to be bullish regardless of changes in the business cycle.

#### **Gap of Business Conditions D.I.** (Small Construction Enterprises) **between "Actual result" in present survey and "Forecast" in previous survey**



Small enterprises in the construction industry tend to be cautious (bearish) in their outlook regardless of changes in the business cycle.

#### Development of Fixed Investment (Large Enterprises, All Industries)



Revised upward from the initial March to June period, downward from the following March to June period.

 $\Rightarrow$  The pattern reflects the carryover of budget between two fiscal years.

#### Development of Fixed Investment (Small Enterprises, All Industries)



Revised upward gradually from the initial March to following year's June.

 $\Rightarrow$  Small enterprises allocate fixed investment only after the projections become clear or when projects are actually implemented.

### 2. Strengths of the Tankan

### 3. Characteristics and Peculiarities of Data

### 4. Revisions to the Tankan

### 4. Revisions to the Tankan



	Addition	Abolition
March, 2001	Software investment	-
<b>March, 2004</b>	Condition for CP issuance Net income Land purchasing expenses, etc.	Overseas production Overseas investment
March, 2014	Inflation Outlook of enterprises	Material costs Personnel expenses Depreciation expenses Financial income Financial expenses All items of quarterly data

### 4. Revisions to the Tankan

#### ■ Five specific Planned Revisions



A. Addition of R&D Investment to Survey Items

**B.** More Efficient Sample Design Using the Economic Census of Japan

**C.** Enhancement of Survey on Outlook for Exchange Rates

**D.** Introduction of New Category regarding Overseas Business Activities

E. Abolition of Some Survey Items

### A. Addition of R&D Investment to Survey Items

- The importance of R&D investment has increased due to development of new technology for Japanese enterprises.
- The national accounts statistics of Japan were revised in December 2016. As a result of this revision, R&D investment is newly regarded as part of capital formations.

#### 4. Fixed Investment, etc.

Fixed Investment including Land Purchasing Expenses*		(Year-to	-year % change)		
		FY2016		FY2017	
			Revision rate	(Forecast)	Revision rate
Large	Manufacturing	4.3	-	14.1	-1.2
Enterprises	Nonmanufacturing	-5.4	-	4.0	0.3
	All industries	-2.1	-	7.7	-0.3
Medium-sized	Manufacturing	6.3	-	13.2	2.1
Enterprises	Nonmanufacturing	-3.1	-	19.6	3.2
	All industries	0.2	-	17.2	2.8
Small	Manufacturing	-6.7	-	0.9	9.8
Enterprises	Nonmanufacturing	16.3	-	-19.9	7.6
_	All industries	8.8	-	-14.1	8.3
	Manufacturing	2.6	-	11.7	0.9
All Enterprises	Nonmanufacturing	-0.7	-	0.8	2.1
	All industries	0.4	-	4.6	1.7

\* Excludes software and R&D investment

Software Investment (Year-to-year % change)					
		FY2016		FY2017	
			Revision rate	(Forecast)	Revision rate
Large	Manufacturing	-5.3	-	4.5	-0.5
Enterprises	Nonmanufacturing	8.8	-	5.6	0.7
	All industries	3.7	-	5.3	0.3
Medium-sized	Manufacturing	-5.4	-	35.4	0.3
Enterprises	Nonmanufacturing	-9.5	-	9.5	3.1
	All industries	-8.9	-	13.4	2.6
Small	Manufacturing	-2.0	-	22.9	-5.8
Enterprises	Nonmanufacturing	11.3	-	22.3	3.3
	All industries	7.3	-	22.4	0.6
	Manufacturing	-5.1	-	7.9	-0.9
All Enterprises	Nonmanufacturing	5.6	-	7.5	1.3
	All industries	2.1	-	7.6	0.6

		FY2016		FY2017	
			Revision rate	(Forecast)	Revision rate
Large	Manufacturing	-0.8	-	2.5	0.0
Enterprises	Nonmanufacturing	10.5	-	2.8	2.6
	All industries	0.1	-	2.5	0.2
Medium-sized	Manufacturing	25.5	-	7.4	1.4
Enterprises	Nonmanufacturing	29.2	-	19.0	-2.3
	All industries	25.9	-	8.9	0.8
Small	Manufacturing	12.2	-	2.5	-1.9
Enterprises	Nonmanufacturing	38.3	-	26.4	6.8
	All industries	14.1	-	4.6	-1.1
	Manufacturing	0.3	-	2.7	0.0
All Enterprises	Nonmanufacturing	12.0	-	4.4	2.4
	All industries	1.3	-	2.9	0.2

#### Software, R&D, and Fixed Investment excluding Land

Purchasing Expenses (Year-to-year % chang					)-year % change)
		FY2016		FY2017	
			Revision rate	(Forecast)	Revision rate
Large	Manufacturing	0.7	-	7.9	-0.6
Enterprises	Nonmanufacturing	-3.1	-	7.1	0.1
	All industries	-1.0	-	7.5	-0.3
Medium-sized	Manufacturing	8.8	-	14.0	1.7
Enterprises	Nonmanufacturing	-7.1	-	22.9	2.8
	All industries	-1.0	-	19.1	2.4
Small	Manufacturing	-7.4	-	4.7	6.9
Enterprises	Nonmanufacturing	18.6	-	-14.0	7.5
	All industries	8.7	-	-7.9	7.3
	Manufacturing	0.6	-	8.2	0.3
All Enterprises	Nonmanufacturing	0.0	-	5.2	1.7
	All industries	0.3	-	6.7	1.0

### A. Addition of R&D Investment to Survey Items



**R&D Investment (FY 2017 forecast)** 

Sources: Cabinet office, BOJ

	Before 2018 Revision	After Revision (Around 2018~)				
Population Information	2012 Economic Census for Business Activity	2014 Economic Census for Business Frame				
Stratification Variable	Industry Capital size Number of Employees	Industry Capital size Sales				
Target on Standard Error Ratio	Sales	Sales				
What is "Stratification Variable"? What is "Standard Error Ratio"?						

### **B.** More Efficient Sample Design Using the Economic Census of Japan

Tankan aims at grasping the current conditions of the domestic economy by a quarterly business survey which adopts a <u>sample survey</u> framework.

v.s. complete survey



• Sampling errors occur during the process of estimating the population.

The statistical accuracy target should be defined by using "Quantitative Items."

• We set the target for "Standard Error Ratio" of population-estimated <u>Sales</u>.

- $\checkmark$  <u>Sales</u> is one of the most important survey items.
- ✓ The correlation between <u>Sales</u> and <u>Fixed investment</u> is generally high.
  - Fixed investment is one of the most popular items for Tankan users.

	Large Enterprises	Medium- sized Enterprises	Small Enterprises
Manufacturing	3%	3%	3%
Nonmanufacturing	5%	5%	5%
Each industry (Nonbinding)	Approx. 10%	Approx. 10%	Approx. 10%

#### Upper Limit of "Standard Error Ratio" of Sales (Population Estimate)

### **B.** More Efficient Sample Design Using the Economic Census of Japan

As shown in the formula below, the error ratio is an index showing the deviation of the sample mean from the population mean.

$$(\text{Standard Error Ratio}) = \frac{(\text{Standard deviation of sample mean})}{(\text{Population mean})}$$
$$(\text{Standard deviation of sample mean}) = \sqrt{\sum_{i=1}^{L} W_i^2 \frac{N_i - n_i}{N_i - 1} \frac{\sigma_i^2}{n_i}}}{(\text{Population mean})} = \sum_{i=1}^{L} W_i \overline{Y}_i$$

- $N_i$ : number of population enterprises in stratum i
- $n_i$ : number of sample enterprises in stratum i
- $\overline{Y}_i$ : population mean (of Sales) in stratum *i*
- $\sigma_i^2$ : population variance (of Sales) in stratum *i*
- $W_i$ : ratio of  $N_i$  to number of population (\*)
- L: number of strata in population (\*)

<sup>\*:</sup> When we calculate error ratio in each industry or scale, we use "population in the industry or scale" instead of "population."

### **B.** More Efficient Sample Design Using the Economic Census of Japan

#### **Before revision**

Population enterprises are subdivided into groups (strata) based on the following three classifications. Sample enterprises are extracted from each stratum.



- Tankan sets its accuracy target for standard error ratios of sales.
- $\rightarrow$  Stratifying the population based on <u>sales</u> is considered to be natural and the most efficient.



2014 Economic census for business frame
 Based on employee stratification and sales data for 2013

Standard Error Ratio	Large Enterprises	Medium- sized Enterprises	Small Enterprises
Manufacturing	1.1%	2.6%	2.7%
Nonmanufacturing	3.0%	4.3%	3.3%

Stratifie	ed by capita	al sizes	
Small	Medium- sized	Large	number of <u>sales</u>

- 2014 Economic census for business frame
- Based on sales stratification and sales data for 2013

Standard Error Ratio	Large Enterprises	Medium- sized Enterprises	Small Enterprises
Manufacturing	0.8%	2.0%	2.6%
Nonmanufacturing	1.3%	3.8%	2.3%

### **B.** More Efficient Sample Design Using the Economic Census of Japan





On this basis, we will make use of this improvement in the sampling methodology to decrease the number of sample enterprises, thereby reducing the total burden on survey respondents.

### C. Enhancement of Survey on Outlook for Exchange Rates

- The Tankan holds a survey on the U.S. dollar-yen outlook for exchange rates among exporting enterprises.
- For aggregation, we have computed weighted averages by the amount of exports.



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- Imports, outward direct investment and direct investment income have become increasingly important, in addition to exports.
- Currencies other than the U.S. dollar, particularly the euro, play a greater role.



### C. Enhancement of Survey on Outlook for Exchange Rates



#### Outward direct investment (net)



Source: Ministry of finance

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	Before Revision	After Revision (Around 2020~)	
Sample enterprises	Exporting enterprises	All sample enterprises	
Type of exchange rates	U.S. dollar-yen rates	U.S. dollar-yen rates Euro-yen rates	
Calculation method	Weighted averages by the amounts of exports	Simple averages	

#### Challenges for the future

- 1. Outlook for exchange rates among importing enterprises
- 2. Other types of exchange rates (e.g. Renminbi-yen rates)

#### **D**. Introduction of New Category regarding Overseas Business Activities



The survey of overseas business activities covers enterprises that satisfy both of the following conditions.

(1) Parent companies located at the top of consolidated business group.

(2) Large enterprises with a capital of 1 billion yen or more.

	Large enterprises		Medium-Sized	Small	
	Pure Holding Company	Parent Company	Subsidiary	Enterprises	Enterprises
Current Survey Items (On a non-consolidated basis)	N/A	Surveyed	Surveyed	Surveyed	Surveyed
Overseas Business Activities (On a consolidated basis)	Surveyed	Surveyed	N/A	N/A	N/A

Note: Pure Holding Companies are currently excluded from our survey coverage.

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In the case where enterprises do not prepare current profits due to the adoption of the IFRS or US-GAAP, they will be allowed to answer consolidated income before income taxes instead.

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**Overseas sales**  $\rightarrow$  Sales to overseas customers excluding companies in a corporate group **Overseas Fixed Investment**  $\rightarrow$  The amount of newly listed tangible fixed assets located overseas

### D. Introduction of New Category regarding Overseas Business Activities

- Survey results of overseas business activities will be released in the following style.
- 1. Year-on-year rates of change in aggregated amounts of each item Shares of overseas amounts in total amounts for sales and fixed investment Aggregated amounts of each items
- 2. Calculated by simply aggregating answers obtained from enterprises
- 3. All industries, manufacturing (basic materials and processing) and non-manufacturing

#### Challenges for the future

- 1. Outlook for exchange rates among pure holding companies answering overseas business activity
- 2. Survey result by country or region

### E. Abolition of Some Survey Items

We will stop the survey on operating profits and change the survey on semiannual figures of investment-related items to that on yearly figures.

	Before Revision		After Revision (Around 2020~)	
Annual Projections	Sales	(Semiannual basis)	Sales	(Semiannual basis)
	Exports	(Semiannual basis)	Exports	(Semiannual basis)
	Exchange rates for Exports (JPY/USD)	(Semiannual basis)	Exchange rates (JPY/USD)	(Semiannual basis)
			Exchange rates (JPY/EUR)	(Semiannual basis)
	<b>Operating Profits</b>	(Semiannual basis)	N/A	
	Current Profits	(Semiannual basis)	Current Profits	(Semiannual basis)
	Net Income	(Semiannual basis)	Net Income	(Semiannual basis)
	Fixed Investment	(Semiannual basis)	Fixed Investment	(Yearly basis)
	Land Purchasing Expenses	(Semiannual basis)	Land Purchasing Expenses	(Yearly basis)
	Software investment	(Semiannual basis)	Software investment	(Yearly basis)
	N/A		R&D investment	(Yearly basis)
Overseas Business Activity	N/A		Sales, Overseas sales, Current profits, Fixed investment, Overseas fixed investment	(Yearly basis)

## Challenges for the Future

- Introducing items about the growth outlook for the economy or industry
- Survey on wages
- Online survey by mobile phone

### Thank you for listening!