About the JCER World Business Climate Index

□Purpose and features

The objective is to promptly convey the latest business climate using a single index, while enabling comparison of the world's leading countries and regions with their various economic scales and development stages.

This index has three features. Firstly this index can assess business climate of each county with the same numerical gauge. Growth rates of production, imports and retail sales are normalized and combined.

Secondly, we display the World Business Climate Index as a weather map to grasp a picture of business conditions at a glance. If this index is equal to the average growth rate over the 10 years from 1996 to 2005, this index is zero. And then, we define the figures which are surrounding zero as Cloudy and divide into five levels.

(Sunny) (Partly cloudy) (Cloudy) (Rainy) (Stormy)

Thirdly, we make an Export Environment Index using weights based on Japan's exports to each country and region in addition to World Business Climate Index using weights based on average nominal GDP for 2004–06 denominated in dollars.

The indices which are similar to this index are CLIs（Composite Leading Indicators）produced by Organization for Economic Cooperation and Development (OECD) and the World Economic Climate (WEC) index published by The German ifo Institute for Economic Research. Compared with CLIs, the main features of the index are that it is expressed in a comparable form because it use the common economic indicator of each country, presents business indicators for the world overall on a monthly basis and is coincident indicator. Although WEC based on questionnaire surveys, is also expressed in a comparable form and produce a business index for the world overall, it lacks immediacy in that it is only published quarterly.

Table. Comparison with other indexes

	Type of component series	Satisfies immediacy	Prepares world indicators	Type of indicator
JCER	Economic indicators	○(monthly)	○	coincident indicator
OECD	Economic indicators	○(monthly)		leading indicator
ifo	Survey Questionnaire	quarterly	○	Leading/coincident indicator

□Subject countries

The index covers not just the advanced countries but also emerging economies. Country and region indices are calculated separately for 15 countries or regions: Japan, United States, European Union, Hong Kong, Korea, Singapore, Taiwan, Indonesia, Malaysia, Philippines, Thailand, Brazil, China, India, and Russia. Europe is covered with a single index for the EU (27 countries) but does

not have separate country indices. The combined gross domestic product of all these countries and regions amounts to more than 80% of the world total.

In addition to the "world" index (which combines the data for all these countries and regions), four regional indices are calculated (for Asia, the Asian NIEs [newly industrialized economies], ASEAN [Association of Southeast Asian Nations], and the BRICs [Brazil, Russia, India, and China]). The NIEs are Hong Kong, Korea, Singapore, and Taiwan, and ASEAN is defined as Indonesia, Malaysia, Philippines, and Thailand. The index for Asia covers the NIEs, ASEAN, and China but excludes Japan.

☐Calculation method

Business Climate Index: An index assessing economic indicator growth rates (year-on-year). With a base (zero) of the average growth rate in the past, it translates each unit of standard deviation into 10 index points. The base indices are imports, production, and retail sales. The calculations are based on the average growth rate and its standard deviation over the 10 years from 1996 to 2005.

Export Environment Index: This index use weights based on Japan's exports to each country and region after calculating the index for each country and region. Naturally, this index dose not include Japanese business climate.

Stock Price Index (reference index): Expresses stock price trends in Japan, the United States, the EU, the NIEs, ASEAN, and the BRICs. It calculates and combines representative stock price indexes of the countries and regions, setting 2005 at 100.

☐Timing of release Around the 20th of each month.

☐Medium of publication The JCER website http://www.jcer.or.jp/eng/

Nikkei Net http://www.nni.nikkei.co.jp/

Index Calculation Method

1. JCER World Business Climate Index

Calculation from monthly indexes

The index uses monthly data in order to provide timely information on global business trends. While gross domestic product (GDP) provides a comprehensive measure of economies, data on it are only released quarterly.

The index uses monthly import and production indexes, which are commonly available from the subject countries (table 1). As a supplementary index, real retail sales are used as far as possible.

Production indices are considered to reflect business trends sensitively and are used by Japan and United States in its coincident indicators. Imports provide a valuable measure of domestic demand. Even though the volume of import is basically used (for some countries the value index divided by the import price index is employed as a substitute), we use dollar-denominated value data if the volume of import is not available in some countries. Commercial sales (retail sales) used here is the real index based on sales volume. For some countries the value index divided by the consumer price index is employed as a substitute. These indices are used as far as possible, although many emerging economies do not release data for them.

Table 1. Composite Indicators of the Business Index

	Imports		Production	Real retail sales
	Volume (real)	Dollar-denominated value		
Japan	○		○	○
US	○		○	○
EU	○		○	○
Hong Kong	○			○
Korea	○		○	○
Singapre	○		○	○
Taiwan	○		○	
Indonesia		○	○	
Malaysia		○	○	
Philippines		○	○	
Thailand	○		○	
Brazil	○		○	
China		○	○	○
India		○	○	
Russia		○	○	

Note: The EU data are for all 27 members. Some of the past data cover only 15 members.

Composed by converting year-on-year change into *z* scores

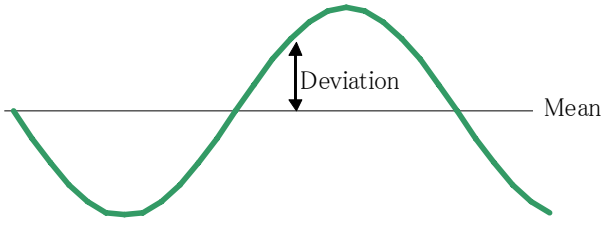
The change in each index from a year earlier is used for calculations. On account of disparities in values depending on the index or country, however, absolute rates of change do not permit judgments on the tone of business. For this reason, increase rates are further converted into z scores.

A z score for index value X_t is derived as follows using the mean for a time range and its standard deviation:

$$z \text{ score} = \text{deviation} / \text{standard deviation} = (X_t - \text{mean}) / \text{standard deviation}$$

In this calculation, values are standardized by first finding how far an index number differs from the mean (the degree of deviation) and then dividing the result by the standard deviation. Because the unit is one standard deviation (1 σ), almost all index numbers (about 95%) will fall within two standard deviations above or below the mean. By means of this conversion into z scores, it becomes possible to make standardized judgments about all indexes, whether they have high or low rates of change or large or small variations from one month to the next.

Charts1.
Illustration of the Mean and the Deviation



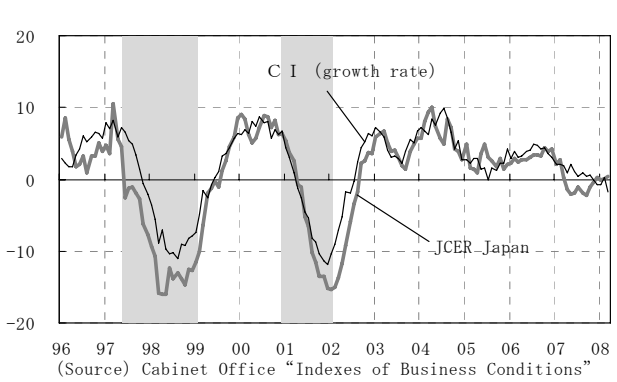
After index values have been converted into z scores, the z scores for all of the data series in each country or region are averaged. This computation method produces a business index for all countries and regions. To make the z scores easier to understand, they are multiplied by 10, giving each standard deviation a value of 10. With the average of the index values over the past set at zero, z scores above zero represent good business conditions, while those below zero represent poor business conditions.

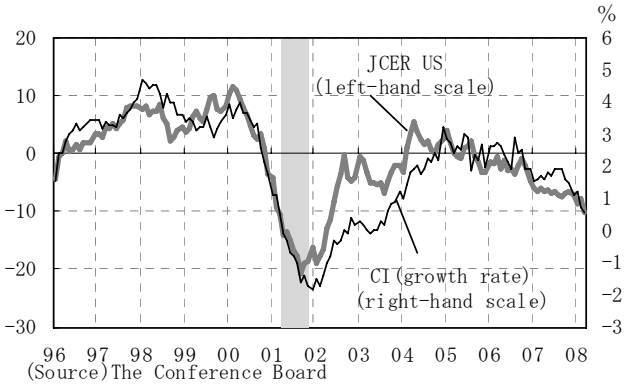
Assessment of the index

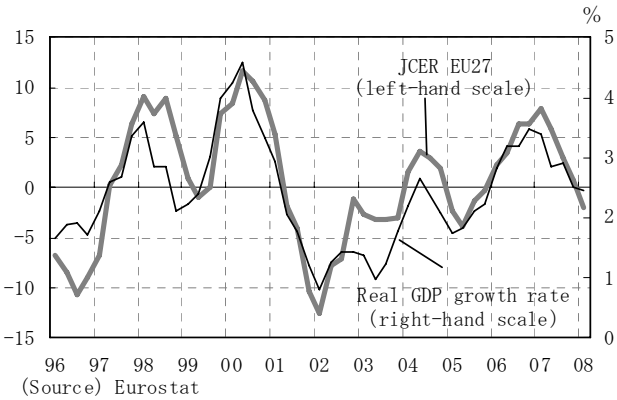
To test the performance of the Business Climate Index, the results it produced for major economies (the world, Japan, the US, and the EU) were compared with the results of composite indicators or Real GDP growth rates (see charts 2). Increase rates of coincident composite indicators were used for Japan and the US, and Real GDP growth rates were used for the world and the EU. As can be seen, the movements in the indices are basically similar. The results produced by the World Business Climate Index are not out of line with general business trends.

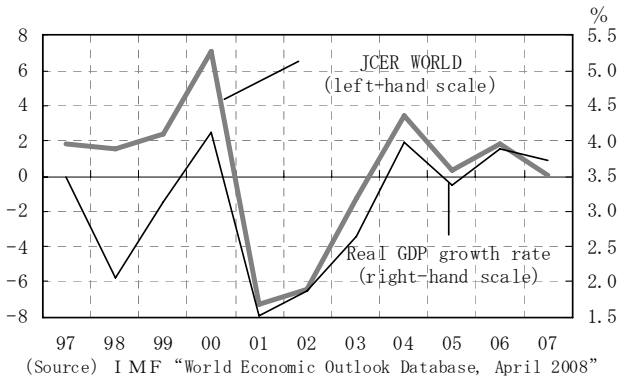
It needs to be cautioned, however, that movements in the index cannot be mechanically read to deduce turning points (peaks and bottoms). The business cycles in many countries do not have clearly delineated peaks and troughs, making it difficult to correlate the index with the phase of the business cycle. For reference, downswings are differentiated from upswings in the charts for the business cycles of Japan and the US.

Charts 2. Comparison of the JCER World Business Climate Index a, Composite Indicators and Real GDP growth rate









Setting of the time range

One issue is what time range to employ for the mean and standard deviation, which are used to calculate z scores. For this index the time range was made the 10 years from 1996 to 2005, a period over which past statistics for all the data series are available. This range covers times of both upswings and downswings without bias in either direction.

Weighted averages for dollar-denominated GDP

After calculating the index for each country and region, values for the world as a whole were computed using weights based on average nominal GDP for 2004–06 denominated in dollars (Table 2a). To express the business tone as seen from Japan, an Export Environment Index is also published using weights based on Japan's exports to each country and region(Table 2b).

Table 2a. Weights Used for the World Business Climate Index

	Nominal GDP (2004–06 average, $ billion)	Weights (%)				
		World	Asia	NIEs	ASEAN	BRICs
Japan	4,440	11.8				
United States	12,438	33.1				
EU 27	13,824	36.8				
Hong Kong	178	0.5	4.0	12.4		
Korea	787	2.1	17.7	54.7		
Singapore	122	0.3	2.7	8.5		
Taiwan	351	0.9	7.9	24.4		
Indonesia	302	0.8	6.8		41.8	
Malaysia	139	0.4	3.1		19.2	
Philippines	101	0.3	2.3		14.0	
Thailand	181	0.5	4.1		25.1	
Brazil	873	2.3				18.5
China	2,273	6.1	51.3			48.3
India	777	2.1				16.5
Russia	782	2.1				16.6
Total	37,569	18.3	100.0	100.0	100.0	100.0

Note: Prepared using World Economic Outlook Database, International Monetary Fund, April 2008 edition.

Table 2b. Weights Used for the Export Environment Index

	Japanese exports (2004–06 average, ¥ billion)	Weights (%)
United States	15,157	26.2
EU 27	10,084	17.5
Hong Kong	4,013	6.9
Korea	5,260	9.1
Singapore	2,077	3.6
Taiwan	4,828	8.4
Indonesia	952	1.6
Malaysia	1,426	2.5
Philippines	1,029	1.8
Thailand	2,445	4.2
Brazil	303	0.5
China	9,208	15.9
India	412	0.7
Russia	551	1.0
Total	57,743	100.0

Note: Prepared using Trade Statistics of Japan, Ministry of Finance.

Preliminary results

Immediacy is of importance to this index, and results for all countries and regions need to be released together. For this reason, when statistics for some of the base series come in late, values are extrapolated based on the rate of change for the preceding month. This means that in the case of these series, values are calculated on the assumption that there has been no substantial change from the preceding month, and the only changes incorporated in the index are those of other published statistics.

At present the base series that sometimes come in late include Philippines' imports, production index and Indonesia's production index(all with a delay of one month). Their impact

on the world index is not that significant. In addition, three-month moving averages are used to determine trends in the index, with the result that the influence of the missing values becomes even smaller.

2. Stock Price Index

Representative stock price indexes of each country are converted to an index with 2005 set at 100, and weighted averages are derived using the market price total for 2005. The stock prices incorporated are as follows:

- Japan Nikkei-225 Stock Average
- US Standard and Poor's 500 Index
- EU Dow Jones EURO STOXX 50 Index
- NIEs
  - Hong Kong Hang Seng Index
  - Korea KOSPI Index
  - Singapore Straits Times Index
  - Taiwan TSE Index
- ASEAN
  - Indonesia Jakarta Composite Index
  - Malaysia KLSE Composite Index
  - Philippines PSEi Index
  - Thailand SET Index
- BRICs
  - Brazil Bovespa Index
  - China SSE Composite Index
  - India BSE Sensex Index
  - Russia Russian Trading System Index

Table 3 Weights Used for the Stock Price Index

	Market Capitalization (2004-06 average, $ billion)	Weights(%)			
		World	NIEs	ASEAN	BRICs
Japan	3,818	11.7			
Unitend States	15,863	48.6			
EU25	8,818	27.0			
Hong Kong	861	2.6	44.0		
Korea	492	1.5	25.2		
Singapore	175	0.5	9.0		
Taiwan	426	1.3	21.8		
Indonesia	70	0.2		17.5	
Malaysia	180	0.6		45.0	
Philippines	31	0.1		7.7	
Thailand	119	0.4		29.8	
Brazil	347	1.1			19.2
China	701	2.1			38.9
India	407	1.2			22.6
Russia	349	1.1			19.4
Total	32,657	100	100	100	100

Note: Prepared using World Bank "World Development Indicators 2007"; Eurostat;
Central Bank of the Republic of China (Taiwan) "Financial Statistics Monthly"

While it would be possible to prepare a stock price index based on real-time change in the market price total, it was decided instead to create an index using the simple method of fixing the weights at a standard time.

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