(Box 3) Export Conditions and Their Risk Assessment

The baseline scenario of the October 2019 Outlook Report is that the timing of a pick-up in the growth pace of overseas economies is likely to be delayed for longer than expected. Accordingly, the timing of Japan's exports moving out of the relatively weak phase and returning to an increasing trend also is expected to be delayed. However, further deterioration is likely to be avoided, with overseas economies continuing to grow moderately on the whole. This box quantitatively examines risks surrounding this outlook for exports.

Since the second half of 2018, the manufacturing sector's sentiment as well as its production and trade activity on a global basis have been somewhat weak, particularly in Asia, mainly against the background of the slowdown in business fixed investment in emerging economies such as China and the deterioration in the cycle for IT-related goods. In this situation, the level of the world trade volume generally has been flat, and its year-on-year rate of change has declined to around 0 percent recently (Chart B3-1). With regard to the outlook, the world trade volume is expected to remain weak for a while, but thereafter its pace of increase is likely to accelerate gradually and return to around the same level as that of world economic growth (Chart 13).

This outlook for the world trade volume is based on the assumption that further deceleration in overall overseas economies will be avoided as

Chart B3-1: World Trade Volume and Manufacturing PMI

Sources: CPB Netherlands Bureau for Economic Policy Analysis; IHS Markit (© and database right IHS Markit Ltd 2019. All rights reserved.).

Notes: 1. Figures for the trade volume are those for real imports. The figure for 2019/Q3 is the July-August average.

2. Figures for the Global Manufacturing PMI are the "J.P. Morgan Global Manufacturing PMI."

the deterioration in the manufacturing sector's sentiment as well as its production and trade activity will not have a large impact on the nonmanufacturing sector. On this point, the fact that accommodative financial conditions generally have been maintained on a global basis, including in emerging economies, can be considered as playing an important role in underpinning domestic demand in these economies and mitigating the negative impact of weak external demand.

On the other hand, as outlined in Box 1, the U.S.-China trade friction seems to be intensifying and becoming prolonged, and the materialization of the effects of fiscal policy in China has been delayed. Thus, for the time being, attention should be paid to the risk that exports will decline along with the further slowdown in overseas economies. Examining the degree of this risk by looking at SCOPE (Surveillance Indices for Critical Overseas Perils to Exports) -- an early warning indicator of Japan's exports -- the number of indicators signaling a deterioration in export conditions was 7 out of 18 in September, representing an increase to around 40 percent of all indicators (Charts B3-2 and B3-3). [36] Developments since the previous Outlook Report are as follows. The following 5 indicators already have signaled a deterioration: (1) the New Export Orders Index of the Global Manufacturing PMI, (2) the OECD business confidence index, (3) the WSTS world semiconductor shipments, (4) world vehicle sales, and (5) the New Export Orders Index of the Japan Manufacturing PMI. In addition to these indicators, mainly reflecting the effects of

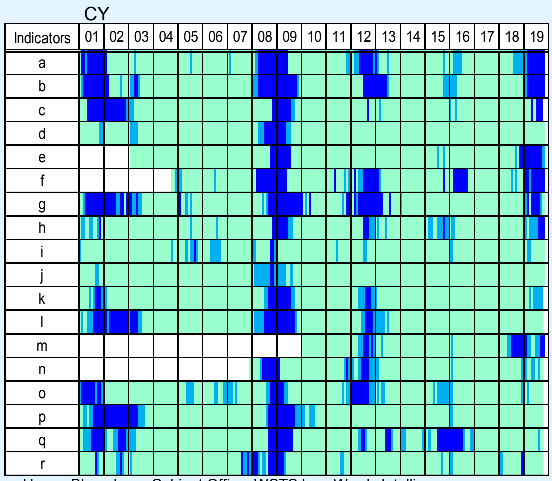
[36] For details of SCOPE, see Box 1 in the January 2019 Outlook Report.

Chart B3-2: Monitoring Indicators

Indicators			
World			
	Corporate	a	Global Manufacturing PMI: New Export Orders Index
		b	OECD business confidence index
		c	WSTS world semiconductor shipments
	Household	d	OECD consumer confidence index
		e	World vehicle sales
Japan			
	Corporate	f	Japan Manufacturing PMI: New Export Orders Index
		g	Machinery orders from overseas: Electronic and communication equipment
U.S.			
	Corporate	h	ISM Manufacturing Index: New Export Orders Index
		i	Philadelphia Fed Manufacturing Business Outlook Survey: Future shipments
	Household	j	University of Michigan Surveys of Consumers: Current Economic Conditions
Euro Area			
	Corporate	k	Business Climate Indicator: Industry, production expectations
		l	Business Climate Indicator: Services sector, demand expectations
Asia			
	Corporate	m	Output of metal shaping machinery in China
		n	China Manufacturing PMI
	Overall	o	Taiwan National Development Council's Monitoring Indicators: Total score
Financial Markets		p	MSCI World Index
		q	MSCI Emerging Markets Index
		r	VIX Index

Note: The Global Manufacturing PMI is the "J.P. Morgan Global Manufacturing PMI." The Japan Manufacturing PMI is the "Jibun Bank Japan Manufacturing PMI."

Chart B3-3: SCOPE



Sources: Haver; Bloomberg; Cabinet Office; WSTS Inc.; Wards Intelligence; IHS Markit (© and database right IHS Markit Ltd 2019. All rights reserved.).

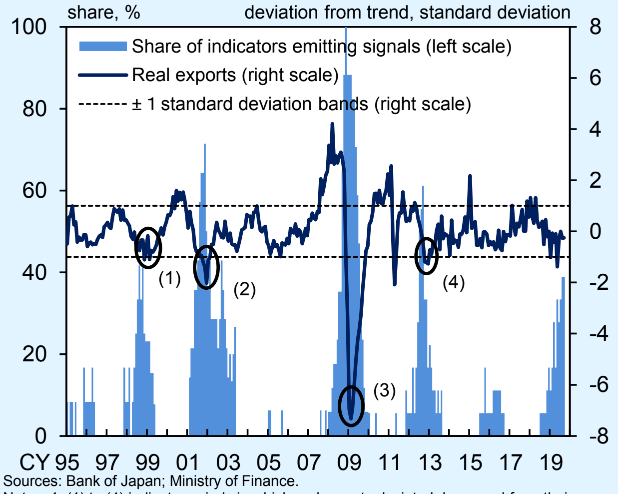
Notes: 1. This chart visualizes the possibility of a significant decrease in real exports by depicting indicator values relative to their respective threshold values. Based on staff calculations.

2. Shaded areas in the chart represent the following for an indicator relative to the threshold set for the indicator: (1) areas shaded in dark blue indicate that the indicator is above the threshold value; (2) areas in light blue indicate that the indicator lies between the threshold value and half of the threshold value; (3) areas in green indicate that the indicator lies below half of the threshold value; and (4) areas in white indicate that no data are available.

the intensified and prolonged U.S.-China trade friction and the slowdown in the Chinese economy, the following also have been signaling a deterioration recently: (6) the New Export Orders Index of the ISM Manufacturing Index and (7) the output of metal shaping machinery in China. The number of indicators signaling a deterioration in export conditions remains small compared to the past four periods when exports decreased substantially -- that is, the phases in which real exports showed a decline of more than one standard deviation from their trend over a certain period at the time of (1) the Asian financial crisis, (2) the collapse of the dot-com bubble, (3) the global financial crisis, and (4) the European debt crisis (Chart B3-4). However, the number of indicators signaling a deterioration clearly has exceeded that during the period of the so-called China shock from the second half of 2015 through the first half of 2016, and downside risks to exports can be assessed as increasing.

In order to quantitatively assess these downside risks to exports, probability distributions of the rates of change in Japan's exports over the next three months (exports at risk) were estimated using quantile regression, within which the aforementioned share of SCOPE indicators emitting signals was an explanatory variable (Chart B3-5[1]). Statistically speaking, this means estimating conditional probability distributions of the rates of change in Japan's exports over the next three months given the share of SCOPE indicators emitting signals. Looking at the estimation results, the latest probability distribution suggests that risks are increasingly skewed to the downside compared with one year ago and at the time of the China shock, although

Chart B3-4: Share of Indicators Emitting Signals



Sources: Bank of Japan; Ministry of Finance.
Notes: 1. (1) to (4) indicate periods in which real exports deviated downward from their trend by more than one standard deviation for two months or more in a four-month period.
2. The latest figures are those for September 2019.

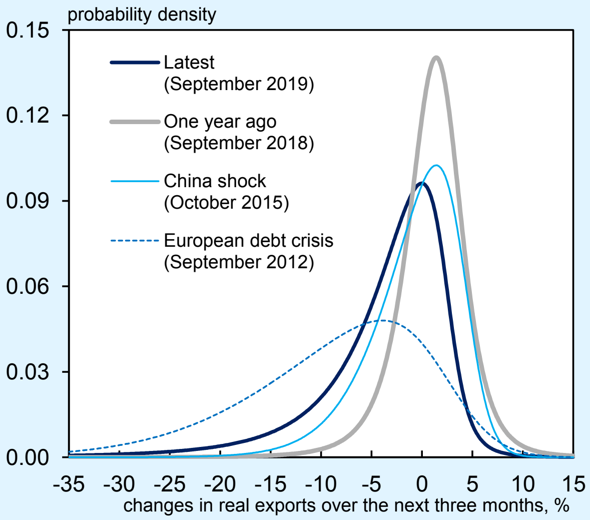
Chart B3-5: Exports at Risk

1. Estimation Model Specification

(Quantile regression)
Dependent variable:
Rate of change in real exports over the next three months

Explanatory variables:
(a) Share of indicators emitting signals for the reference month (this variable is set to 0 when the share is below the peak observed in the preceding six months)
(b) Rate of change in real exports over the past three months
(c) Constant

2. Estimation Results



Sources: Bank of Japan; Ministry of Finance.
Note: The probability density is obtained by fitting a skewed *t* distribution to values from the quantile regressions.

the degree is not as severe as at the time of the European debt crisis (Chart B3-5[2]).

Thus, downside risks to Japan's exports are increasing as the manufacturing sector's production and trade activity on a global basis has decelerated against the background of the intensified and prolonged U.S.-China trade friction and slowdowns in emerging and commodity-exporting economies such as China. Under these circumstances, attention should be paid to the possibility that the risk of a substantial decrease in exports would increase further if a tightening of financial conditions, such as a significant decline in stock prices and a rise in credit risk premiums, also were to occur, as seen in the past four periods when exports fell sharply.