

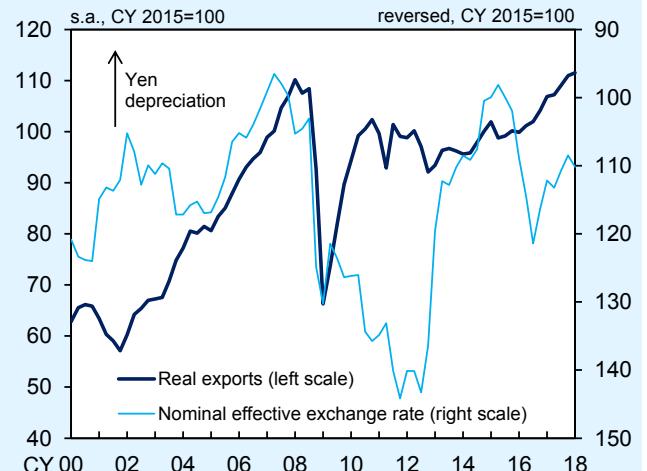
(Box 2) The Impact of Exchange Rates on Real Exports

With regard to the link between real exports and exchange rates, Japan's real exports -- after having followed an uptrend amid the depreciation of the yen from 2005 through 2007 -- fell sharply when the yen rapidly appreciated immediately after the global financial crisis in 2008 (Chart B2-1). Since then, however, the link between exports and exchange rates appears to have weakened.

To examine this issue quantitatively, we estimated a time-varying parameter vector auto-regression (VAR) model consisting of three variables: the growth rate of overseas economies, the real effective exchange rate, and real exports (all in terms of a quarter-on-quarter change) (Chart B2-2). The estimation results indicate that, while the sensitivity of exports to exchange rate shocks increased through the mid-2000s, it fell sharply after the global financial crisis, and in recent years, exports have been less affected by exchange rates (Chart B2-3).

One of the reasons why the exchange rate sensitivity of exports has declined is that the price-setting behavior of Japanese firms has changed. For instance, looking at trends among automakers, before the global financial crisis, they undertook a pricing strategy to fix export prices in yen (i.e., producer currency pricing), and lowered export prices in the contract currency to increase market share when the yen depreciated (Chart B2-4). On the other hand, in recent years, automakers increasingly have tended to fix export

Chart B2-1: Real Exports and Exchange Rate



Sources: Bank of Japan; Ministry of Finance; BIS.

Note: Real exports are based on staff calculations.

Chart B2-2: VAR Model Specifications

Estimation Model: 3-Variable Time-Varying Parameter VAR

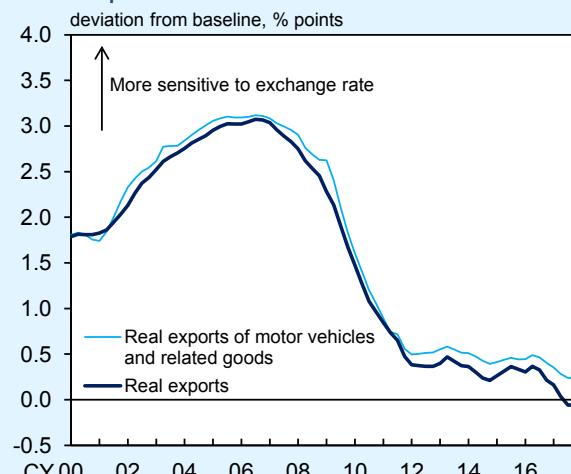
1. Growth rate of overseas economies, s.a., q/q % chg.
2. Real effective exchange rate, q/q % chg.
3. Real exports, s.a., q/q % chg., or real exports of motor vehicles and related goods, s.a., q/q % chg.

Shock identification is based on Cholesky decomposition in the above order.

Lag: 1 quarter

Estimation period: 1988/Q2-2017/Q4

Chart B2-3: Exchange Rate Sensitivity of Exports



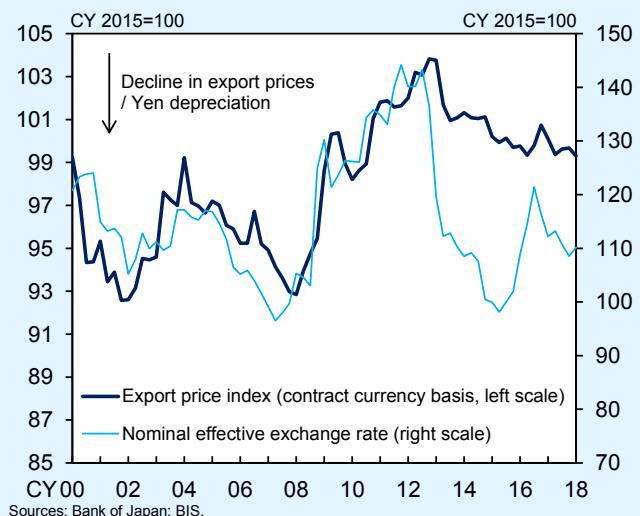
Sources: IMF; BIS; Bank of Japan; Ministry of Finance, etc.

Note: Figures are 4-quarter cumulative changes in response to a 10% Japanese yen depreciation shock.

prices in the contract currency (i.e., local currency pricing), leading to a decline in the link with exchange rates. A reason for such changes is that exports of Japanese firms have shifted to higher value-added goods, and thus they are less likely to get involved in price competition to secure market share (Chart B2-5).

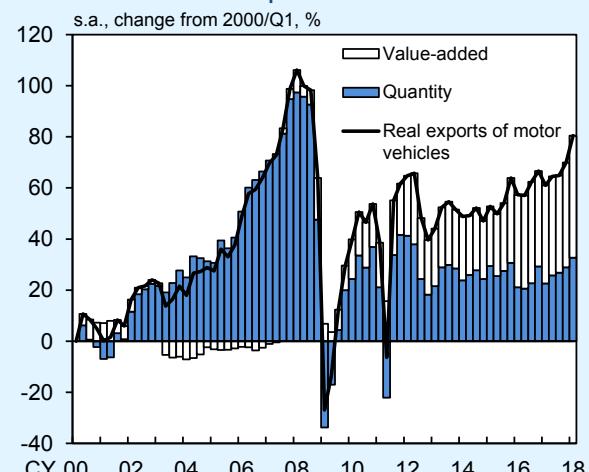
Meanwhile, an appreciation of the yen exerts downward pressure on corporate profits when sales denominated in foreign currencies and dividend payments from abroad are converted into yen. In fact, the primary income balance, which reflects such movements in profits, is closely linked to exchange rates (Chart B2-6). However, compared to fluctuations in profits due to changes in export quantities, those due to changes in the terms of trade are considered to have less effect on business fixed investment.³⁴

Chart B2-4: Export Prices of Motor Vehicles



Sources: Bank of Japan; BIS.

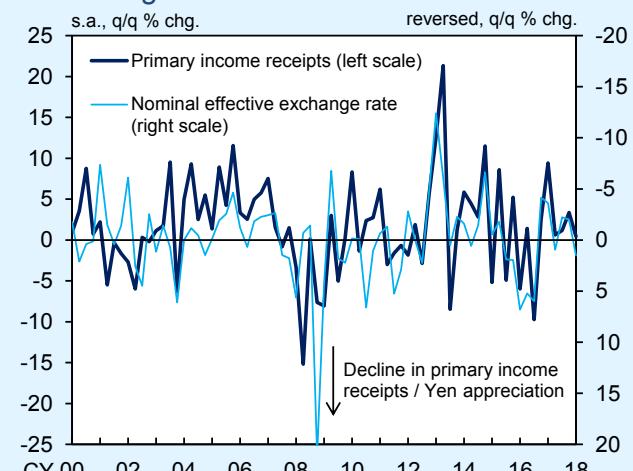
Chart B2-5: The Rising Value-Added of Motor Vehicle Exports



Sources: Bank of Japan; Ministry of Finance.

Note: Real exports of motor vehicles are based on staff calculations.

Chart B2-6: Income Balance and Exchange Rate



Sources: Ministry of Finance and Bank of Japan; BIS.

Note: The figure for primary income receipts for 2018/Q1 is the January–February average.

³⁴ For details, see "Corporate Profits and Business Fixed Investment: Why are Firms So Cautious about Investment?," Bank of Japan Review Series (2016-E-2).