

Annex



IV. Annex

Movements in the Terms of Trade in Taiwan and Other Selected Economies

Terms of Trade Definition

Terms of trade, defined as export prices relative to import prices, measures the quantity of imports that can be purchased through the sale of a fixed quantity of exports.

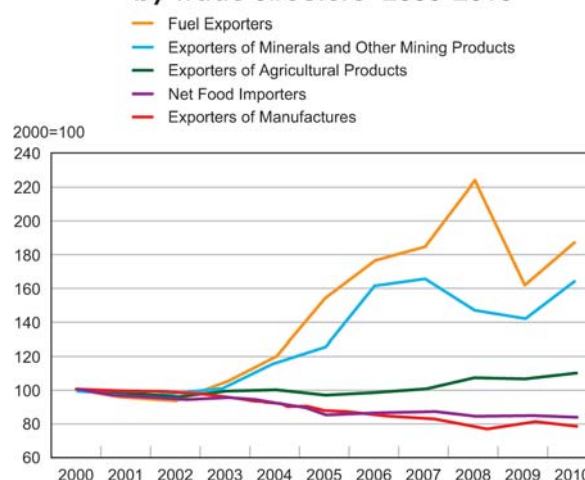
$$\text{Terms of Trade} = \frac{\text{export prices (Px)}}{\text{import prices (Pm)}}$$

A country's terms of trade improves/deteriorates when its import prices increase less/more than its export prices, which shows that one unit of exports can purchase more/less imports, increasing/decreasing the purchasing power of its national income. In other words, an improvement in a nation's terms of trade is good in the sense that the nation can buy more imports with any given level of exports.

Terms of Trade in Selected Economies

In broad terms, movements in the terms of trade depend on the predominant trade structure. According to the World Economic Situation and Prospects released by the United Nations in March 2011, since 2000, fuel exporters and exporters of minerals and other mining products have experienced large swings in their terms of trade as commodities prices have fluctuated. Particularly, economies rich in oil and minerals and mining products, such as the members of the Organization of the Petroleum Exporting Countries (OPEC), Australia and Brazil, gained significant improvement

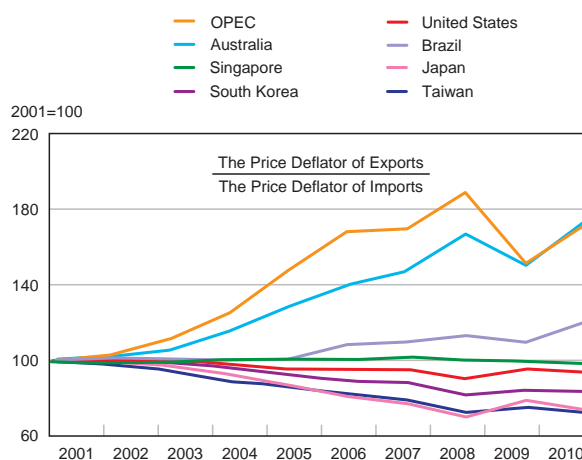
Net Barter Terms of Trade by Trade Structure* 2000-2010



Source: United Nations, *World Economic Situation and Prospects*, March 2011.

Note: * Selected Developing and Transition Economies.

Terms of Trade in Selected Economies 2000-2010



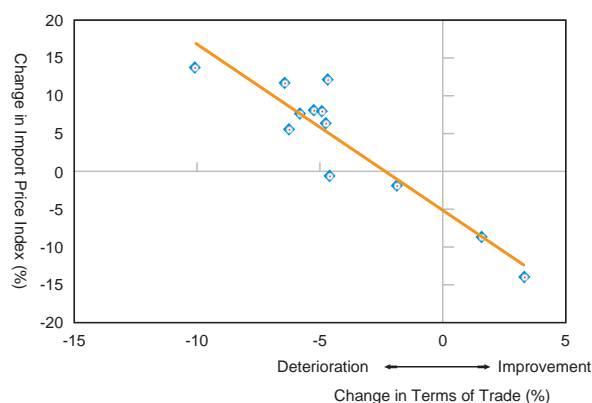
Source: DGBAS, Executive Yuan, March 2011.

in the terms of trade due to hikes in exports prices. In contrast, economies with high shares of imports of energy, food and industrial raw materials like Taiwan, Japan and South Korea, saw declining terms of trade.

Taiwan: Deteriorating Terms of Trade Due to Rising Import Prices

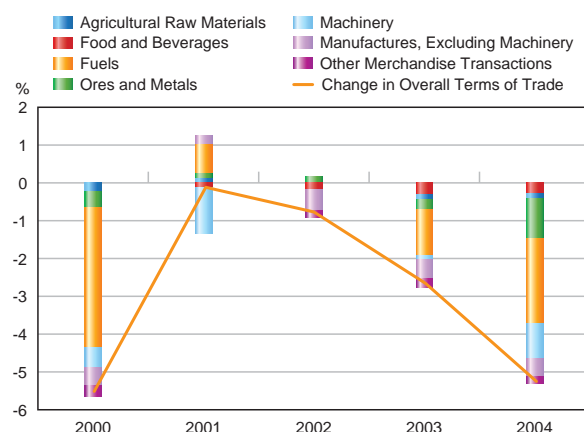
With stagnant prices for manufactured exports, rising import prices became the predominant factor driving Taiwan's terms of trade between 2000 and 2010. During this period, soaring international oil prices led import prices of fuel to increase, accounting for the largest part of Taiwan's worsening terms of trade.

Terms of Trade and Import Prices



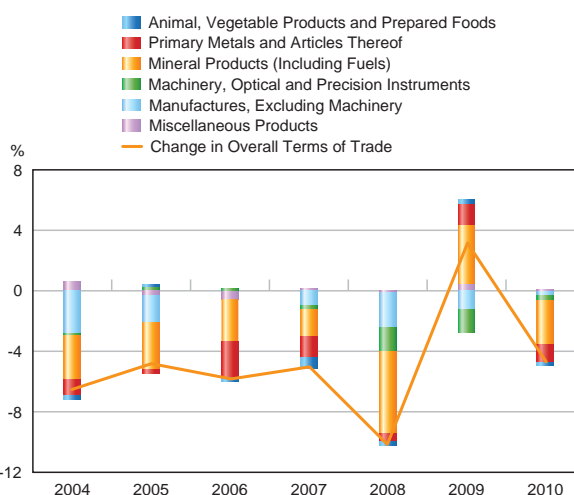
Source: DGBAS, Executive Yuan.

Contribution of Different Product Groups to Terms of Trade Changes in Taiwan (2000 - 2004)



Source: UNCTAD (2005).

Contribution of Different Product Groups to Terms of Trade Changes in Taiwan (2004 - 2010)

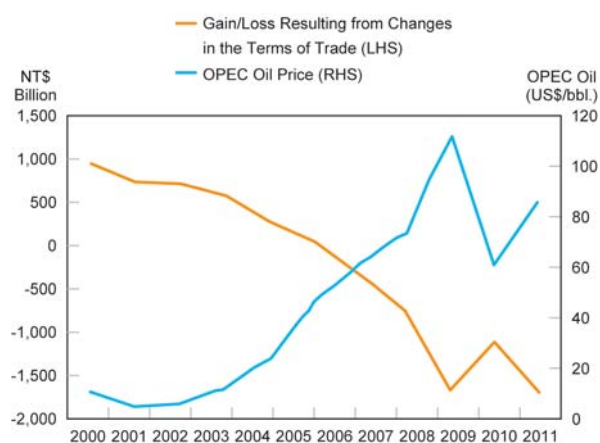


Source: CBC.

Effects of International Oil Price Changes on Real National Income

Due to Taiwan's heavy dependence on energy imports, surging international oil prices led to significant losses resulting from a deterioration in the terms of trade, thereby reducing Taiwan's real national income. The figure below shows the losses caused by a decline in the terms of trade as OPEC crude oil price climbed.

Gain or Loss Resulting from Changes in the Terms of Trade versus OPEC Crude Oil Price



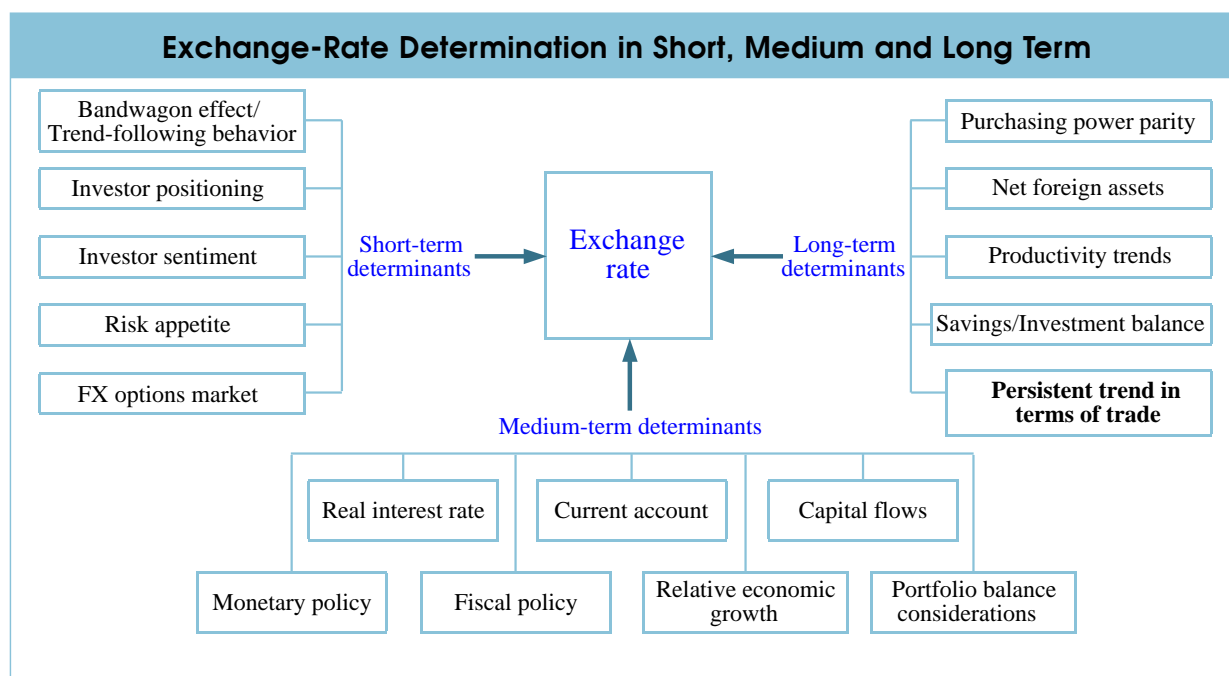
Source: DGBAS; OPEC.

Terms of Trade: A Long-run Determinant of Exchange Rates

In principle, the terms of trade is one of the long-run determinants of open or trade-dependent economies' exchange rates. The chart below exhibits the short-, medium- and long-term factors influencing the exchange rate. Among these factors, several of the most salient determinants of countries' exchange rates are their interest rates, inflation rate differentials, public debts, current account positions, political stability, and persistent trends in the terms of trade. This relationship is illustrated by the equation.

$$e = f(i^d - i^f, \pi^d - \pi^f, CUR, D, TOT, \text{others} \dots)$$

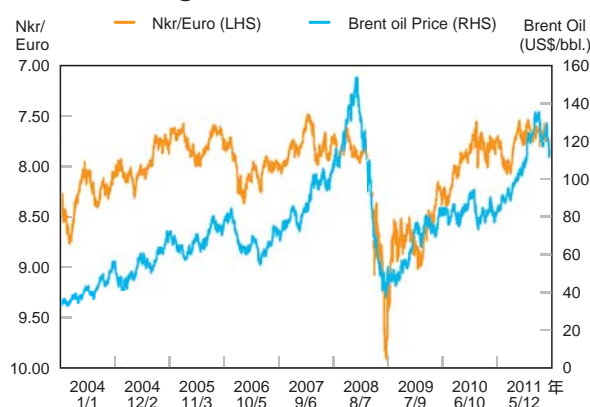
where i^d and π^d are interest rate and inflation rate in home country; i^f and π^f are corresponding rates in foreign country; CUR is current account balance; D is government debt; TOT is the terms of trade; and e is the real exchange rate, expressed as the price in foreign currency of a unit of local currency. An increase in e represents an appreciation of the local currency.



Source: Rosenberg (2003) .

While numerous factors affect exchange rates, changes in the terms of trade may, at times, exert a strong influence on the direction that exchange rates take. A rise in the terms of trade in one country can result in an increase in its currency's value, and vice versa. As noted earlier, if the price of a country's exports rises by a greater rate than that of its imports, its terms of trade improves. An improvement in a nation's terms of trade implies greater demand for the country's exports and, in turn, an increase in its export revenues. Rising export revenues provide an increase in demand for the country's currency and results in currency appreciation. Take one of the world's main oil exporters, Norway, as an example. One finds a strong positive relationship between the movement in oil prices and the value of the Norwegian krone.

The Norwegian Krone and the Price of Oil



Source: Thomson Reuters Datastream.

Summary

Over the last decade, commodity prices have surged, significantly improving the terms of trade in resource-rich countries. However, countries highly dependent on imports of oil and raw materials, such as Taiwan, Japan and Korea, experienced a decline in their terms of trade and, in turn, a decrease in their real national incomes.

The movement in a country's terms of trade may be closely linked to that of its exchange rate. Theoretically, a rising terms of trade in one country resulting from strong demand for its exports generally leads to currency appreciation.

The terms of trade can be improved by any means that will increase the prices of exports relative to imports. For a small open economy like Taiwan, these measures include continuously adjusting the industrial structure, developing high value-added manufacturing, services and green industries, and reducing its reliance on imported energy, etc.

Reference

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2. Rosenberg, Michael R. (2003). *Exchange-Rate Determination Models and Strategies for Exchange-Rate Forecasting*, McGraw-Hill, New York.
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