9 Trade Balance and the Terms of Trade

9.1 Introduction

Changes in the exchange rate impact the trade balance by changing the terms of trade. The relationship between terms of trade and the trade balance is ordinarily analyzed using the Marshall-Lerner condition (ML condition). The ML condition holds that deterioration in the terms of trade is to improve a country’s trade balance, provided that the sum of the country’s price elasticity of demand for exports and imports must be greater than one in absolute value. The principle is named after the economists Alfred Marshall and Abba Lerner. As a devaluation of the exchange rate reduces the price of exports, the demand for exports will increase. The price of imports, meanwhile, will rise, and the demand for imports will decrease. The net effect on the trade balance will depend on price elasticities. If exported goods are elastic to price, their demand will increase proportionately more than the decrease in price, and the total export revenue will increase. If imported goods are elastic, the total import expenditure will decrease. The trade balance will improve in both cases (Fig. 9.1).

To check the ML condition using actual data, it is necessary to estimate both the import function and the export function. Such an approach has been taken in past research, i.e. Arize (1990), Goldstein and Khan (1978), Houthakker and Magee (1969), and Warner and Kreinin (1983). In such research, it was reported that the ML condition was fulfilled. However, there

Fig. 9.1. Marshall-Lerner condition
is a problem with this approach. In order to estimate the export function and the import function, it is necessary to collect data such as world income, world export prices and effective exchange rates, and to specify trading partners. For many countries, however, it is difficult to collect such data.

Haynes and Stone (1982) attempt to address this issue by directly analyzing the relationship between the trade balance and terms of trade – an alternative approach. They analyze the impact of terms of trade on the trade balance by looking at the estimated coefficients of terms of trade using a distributed lag model. Haynes and Stone (1982), on the other hand, conduct their analysis within the framework of regression analysis and are thus unable to avoid the spurious regression of Granger and Newbold (1974).

With the recent development of time series analysis, cointegration analysis is now used for analyzing long-run relationships among variables. Arize (1996) uses cointegration analysis to empirically analyze the long-run equilibrium between the trade balance and the terms of trade using quarterly data on sixteen countries from 1973 to 1992, i.e. the G7 members (Canada, France, Germany, Italy, Japan, the United Kingdom, the United States), Denmark, Finland, the Netherlands, Switzerland, and five newly industrializing economies (NIES: India, Korea, Malaysia, Mexico, Sri Lanka). Arize (1996) reports a long-run relationship between the trade balance and the terms of trade in many countries.

This chapter expands on this Arize (1996) analysis by empirically analyzing the relationship between the trade balance and the terms of trade in sub-Saharan African countries. A distinctive feature of this research is the use of panel unit root and panel cointegration analysis, an approach not attempted by Arize (1996). With many of the sub-Saharan African countries, the only data available are annual and the samples sizes are small. The individual nonstationary time series analysis is known to have low power for short span of the data. We pool the data of sub-Saharan countries in the hopes of adding cross-sectional variation to the data that will increase the power of panel unit root or panel cointegration tests.

9.2 Basic Model

Following Haynes and Stone (1982) and Arize (1996), we can write the long-run relationship between the trade balance and the terms of trade as follows:

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TB_t = \alpha + \beta TOT_t + u_t ,
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(9.1)