Price and Income Effects in Turkish Foreign Trade

By

Aysit Tansel and Sübidey Togan

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I. Introduction

The purpose of this paper is to study the behaviour of imports and exports of Turkey at the aggregate level. We focus on the estimation of conventional aggregate import and export demand functions and hence on the determination of the relevant price and income elasticities. The issues considered include the analysis of simultaneity problems and the choice between static and dynamic formulations.

The organization of the paper is as follows. Section II addresses the main methodological issues in trade modelling. Section III presents and discusses the estimation results. The principal conclusions appear in Section IV. Data sources are given in the Appendix.

II. Trade Modelling

We consider the imperfect substitutes model of trade, the key underlying assumption of which is that neither imports nor exports are perfect substitutes for domestic goods. The barebones of the model can be represented as follows:

\[ x^d = x^d(y, p_x^d/p) \]  \hspace{1cm} (1a)
\[ x_s = x_s(y, p_x/p) \]  \hspace{1cm} (1b)
\[ m = m(y, p_m/p) \]  \hspace{1cm} (1c)
\[ p_x = p_x^s (1+s)E \]  \hspace{1cm} (1d)
\[ p_m = p_m^s (1+t)E \]  \hspace{1cm} (1e)
\[ x^d = x^s \]  \hspace{1cm} (1f)

The six equations determine the quantity of exports demanded by the rest of the world \((x^d)\), the quantity of exports supplied by the home country \((x_s)\), the quantity of imports demanded \((m)\), the domestic price of exports received

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by exporters \((p_x)\), the foreign price of exports \((p^*_x)\), and the domestic currency price paid by importers \((p_m)\). The exogenous variables are the level of foreign real income \((y_f)\), the foreign price of goods produced in the rest of the world \((p_f)\), the level of domestic real income \((y)\), the price of domestically produced goods \((p)\), the proportional export subsidy rate \((s)\), the exchange rate \((E)\), the proportional tariff rate \((t)\), and the foreign price of imports \((p^*_m)\).

The export and import functions \((la)\) and \((lc)\) represent the quantity demanded as an increasing function of the level of real income in the importing region and as a decreasing function of the relative price of the imported good's own price to the price of domestic substitutes. The export-supply function \((lb)\) indicates that the supply of exportables depends positively on both the real income and the ratio of export price to domestic prices. Exports are assumed to rise as real income serving the purpose of an index of the productive capacity of the country rises. Furthermore as the price of exportables rise relative to domestic prices production of exports will become more profitable and as a result export supply will increase. Eqs. \((ld)\) and \((le)\) determine the domestic prices of importables and exportables. Eq. \((lf)\) denotes the equilibrium condition in the market for exportables.

Thus far the demand and supply equations for exports and imports have been presented as “equilibrium” relationships. But in the real world importers and exporters will not always be on their long-run demand and supply schedules. The presence of adjustment costs and incomplete information implies that adjustment of the dependent variables to explanatory ones will not be instantaneous. To incorporate the pattern and length of such time lags we first specify the equations within the framework of general distributed lag model with geometrically declining weights. In particular, assuming imports to adjust to the difference between the demand for imports and actual imports in the previous period

\[
m_t - m_{t-1} = \alpha(m^d_t - m_{t-1})
\]

we obtain\(^1\)

\[
m_t = \alpha \sum_{i=0}^{\infty} (1-\alpha)^i m^d_{t-i}
\]

In this specification the parameter \(\alpha\) measures the response of actual imports to the demand for imports. It is bounded by \((0, 1)\). If \(\alpha\) equals unity then actual imports equal desired level at each time period; if \(\alpha\) equals zero then equilibrium will never be reached. Finally we note that the average time lag in adjustment equals \((1-\alpha)/\alpha\).\(^2\)

Lastly we consider the error correction model of Davidson et al. [1978].

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\(^1\) When estimating the model we write the relations in log-linear terms.

\(^2\) For good surveys of trade modelling see Magee [1975] and Goldstein and Khan [1985].