Input-Output Anatomy of Import Elasticities

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Abstract: The elasticity of imports with respect to final demand, calculated from the 1964 and 1970 input-output tables for Austria, is equal to 1.35. Input-output analysis makes it possible to show how the value of the import elasticity is related to following structural changes: i) Changes in the shares of final demand components (i.e. of consumption, capital formation and exports) on total final demand; ii) changes in the pattern of final demand components; iii) changes in the technology matrix; iv) substitution of domestic output by imports in the final demand; and v) substitution of the domestic output by imports in the intermediate demand.

The value of the elasticity of imports with respect to total final demand, as well as partial elasticities disaggregated by final demand components, intermediate and final imports, or by industries, can be directly calculated from data in input-output tables. Input-output analysis also provides the possibility to relate the import elasticities to various changes in the structure of the economy.

Austrian Input-Output Tables

The calculation of import elasticities and the analysis of the role of structural change will be demonstrated on the input-output data for Austria.

At present three input-output tables are available for Austria. One for 1961 [Sagoff], one for 1964 [the Central Statistical Office, the Austrian Institute for Economic Research and the Federal Chamber of Commerce] and a third, preliminary table for 1970 [Richter, Teufelsbauer]. The Institute and the Chamber of Commerce also compiled matrices of imported goods at both customs-clearance and cif prices, which, however, were not published.

Only the 1964 and 1970 tables can be used for the calculation of import elasticities. Both tables are disaggregated by 31 industries and valued at current prices. Due to lack of data on final imports final demand is divided only into three components, i.e. i) consumption (private and public), ii) capital formation (gross fixed investment and changes in stocks) and iii) exports.

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Definition of Import Elasticities Calculated from Input-Output Data

Elasticities of imports with respect to final demand were calculated from the 1964 and 1970 input-output data as follows:

\[ e = \frac{(M_{70} - M_{64})/M_{64}}{(Y_{70} - Y_{64})/Y_{70}} \]

where:

\[ M_{64}, M_{70} = \text{Imports of goods and services in 1964 and 1970 respectively, or, alternatively, imports by industries of origin.} \]

\[ Y_{64}, Y_{70} = \text{Total final demand in 1964 and 1970 respectively, or alternatively, levels of final demand components.} \]

The general formula allows for various combinations of total or partial values. In the paper the following elasticities are presented and investigated:

a) Elasticity of total imports with respect to total final demand.

b) Elasticities of total imports with respect to levels of final demand components.

c) Elasticities of imports by industries of origin with respect to total final demand.

d) Elasticities of imports by industries of origin with respect to levels of final demand components.

Mathematical definitions of variables and of the alternative elasticities are given in the Appendix.

Elasticities of Imports with Respect to Final Demand and its Components

Elasticities of total imports were calculated from the full import content of final demand and of its components. The full import content was divided into intermediate imports (calculated by the inverse of the Leontief matrix) and into final imports.

The results are presented in Table 1. Between 1964 and 1970 there was a 1 per cent increase in total final demand followed by an increase in imports of goods and services by 1.35 per cent, out of which 0.75 per cent were intermediate imports and 0.60 per cent final imports. Elasticities of total imports with respect to the levels of final demand components were equal to 0.20 for exports, 0.71 for consumption and 0.43