Available online at www.sciencedirect.com
SCIENCE DIRECT®
Transportation Research Part E 41 (2005) 357–372
TRANSPORTATION RESEARCH PART E
www.elsevier.com/locate/tre

Determinants of the demand for maritime imports and exports

Pablo Coto-Millán [a,*], José Baños-Pino [b], José Villaverde Castro [a]

[a] Department of Economics, University of Cantabria, Avenida Los Castros, s/n 39005 Santander, Spain
[b] Department of Economics, Campus del Cristo, University of Oviedo, 33071 Oviedo, Spain

Received 6 December 2003; received in revised form 10 February 2004; accepted 29 May 2004

Abstract

The main contribution of this research is to offer a theoretical explicative model and provide empirical evidence to the determinant variables which explain the behaviour of maritime imports and exports for a particular economy such as the Spanish one. Until now, maritime transport demand functions have been estimated without taking into account whether they referred to imports or exports. Moreover, the international trade literature has, from a theoretical point of view, formulated and estimated import and export demand functions in general without considering the mode of transport used.

JEL classification: L90; L92
Keywords: Maritime; Imports; Exports; Demand elasticities

1. Introduction

This paper provides an analysis of the determinants of Spanish maritime export and import functions, using as a reference a conventional model of international trade. The study focuses on the export and import of 'General Cargo'. The data employed are quarterly and cover the years 1975–1993.

* Corresponding author. Tel.: +34 942201630; fax: +34 942201603.
E-mail address: cotop@unican.es (P. Coto-Millán).

1366-5545/$ - see front matter © 2004 Published by Elsevier Ltd.
doi:10.1016/j.tre.2004.05.002

Traditionally, the mainstream of the literature on international trade assumes that there are no transport costs (see, for example, Houthakker and Magee, 1969; Khan, 1974; Bahmani-Oskooee and Alse, 1994; Marquez, 1994; Marquez and McNeilly, 1988). However, in our paper we include the maritime transport costs in seaborne trade as one more explanatory variable (Metaxas, 1971; Stopford, 1968).

As well as at international level, in Spain, some empirical works have been carried out on import and export functions such as those by Donges (1972), Mochón and Ancochea (1979), Bonilla (1978), Casado et al. (1982), Mauleón (1985), Marías (1987), Fernández and Sebastián (1989), García Solanes and Beyaert (1989), Sebastián (1991), Buisan and Gordo (1994), Mauleón and Sastre (1995). Nevertheless, none of these works consider maritime transport costs or attempt to estimate maritime import and export functions.

Antecedents of this paper are Coto-Millán (1986, 1988, 1991), in which aggregated maritime transport demand functions are considered from 1974 to 1983; Coto-Millán and Sarabia, 1993, in which the study above is updated from the period 1974–1992; and Coto-Millán and Baños-Pino, 1996, in which maritime transport demand functions are considered as aggregate derivative functions (i.e. imports plus exports) and national short sea shipping is excluded.

In order to estimate long-run relationship both for maritime exports and imports, we have used the Johansen multivariate cointegration technique and the most recent residual-based test for the null hypothesis of cointegration, developed by Shin.

The paper is organised as follows. In Section 2 the theoretical model is presented. Section 3 describes the data set that have been used. Section 4 discusses the empirical results. Finally, Section 5 provides our concluding remarks.

2. The model

In general terms, import functions are of the type

$$M = M\left(\frac{Y}{P}, \quad \frac{\mathrm{Pm}}{P}\right) \tag{1}$$

where the volume of imports in a particular country (M) depends on its monetary income (Y), the prices of imports (Pm) and the prices of domestic goods (P). The volume of imports is generally expressed in physical or real units obtained from the quotients of the monetary value by their prices. However, the prices of imports are approximated from the so-called unit value indexes, which undoubtedly present errors. One of the original findings of this work is that the use of it eliminates these errors since the physical or real units of the import and export goods are available.

Eq. (1) can be written as:

$$M = M(y, e') \quad \text{where } \frac{Y}{P} = y \quad \text{and} \quad \frac{\mathrm{Pm}}{P} = e' \tag{2}$$

where e' is the relative import price and where the expected signs are

$$\frac{\partial M}{\partial y} > 0, \quad \frac{\partial M}{\partial e'} < 0$$