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Armington elasticities and induced intra-industry specialization: The case of France, 1970–1997

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Abstract

Elasticities of substitution among imports and competing domestic production (Armington elasticities) play a key role in open-economy computable general equilibrium (CGE) modeling. Armington elasticities used in CGE models refer to heterogeneous product groups rather than homogeneous products, thus reflecting differences in the composition of the respective imported and domestic production. As these differences may rise over time, due to intra-industry specialization, empirical Armington elasticities will decrease. The paper examines this conjecture, using data for France, 1970–1997. It finds that for most product groups considered the Armington elasticity had a peak value in the 1980s and declined thereafter. While the average elasticity amounts to 0.84 in 1976–91, it declined almost continuously to 0.21 in 1982–97.

JEL classification: F170; F150; C680

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1. Introduction

The "Theory of Demand for Products Distinguished by Place of Production" (Armington, 1969) assumes that imported goods and their domestic counterparts are incomplete substitutes. This assumption is the mainstay of open-economy CGE modeling, and the elasticity of substitution between imported and domestic goods – the so-called Armington elasticity – is a key parameter in these models.

At the conceptual level, the Armington framework is an early version of the love-for-variety approach in consumer theory. In this view, imported and domestic goods differ from each other in

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the perception of the representative agent, and the Armington elasticity reflects the degree of perceived difference. However, while imported and domestic products differ from each other, each of them is viewed as a homogeneous good.

At the empirical level, Armington elasticities are usually recovered from estimates of the price responsiveness of trade. Since actual price responsiveness depends not only on the perceived difference of imported and domestic goods, but also on the existence and strictness of (non-tariff) trade barriers, estimated Armington elasticities reflect not only incomplete substitutability due to differences in (perceived) product characteristics, but also de facto incomplete substitutability due to trade barriers. As a result, estimated Armington elasticities are likely to rise when trade barriers are relaxed.

Another difference between conceptual and empirical Armington elasticities is that the latter usually refer to heterogeneous *groups* of products rather than to homogeneous goods.[1] The composition of these groups may change over time. Especially, rising intra-industry specialization may imply that the composition of the goods produced by a given domestic industry becomes more different from the composition of the goods produced by the corresponding industry abroad. Domestic and imported product groups will thus become more different. As a result, Armington elasticities with respect to product groups are likely to decline with increasing intra-industry specialization.

The two mechanisms which may induce estimated Armington elasticities to change over time (at given preferences of the agents) are, of course, related to each other: intra-industry specialization likely arises as a *result* of trade liberalization. Relaxation of trade barriers thus has an indirect (or secondary) effect on industry-specific Armington elasticities, as it induces domestic and imported product groups to become more different, and a direct (or primary) effect, as it increases the de facto substitutability. The latter effect is an *immediate* consequence of trade liberalization and may become effective even in the short term. The secondary effect, conversely, is likely to gain momentum only with some delay, as specialization patterns change. It can, therefore, be conjectured that in the wake of trade liberalization Armington elasticities first rise and then decline, implying a hump-shaped pattern over time.

The purpose of this paper is to examine the validity of this conjecture.[2] This aim is achieved by using data for France, 1970–1997, taken from EUROSTAT's *New Cronos* database. The motivation for using this data source is that, in contrast to alternative sources, the commodity classification used to aggregate traded goods equals the classification used for domestic production, which is an indispensable requirement for this analysis. However, a shortcoming of this database is that time series of sufficient length are available only for a relatively small number of European Union member countries. For most countries, the time series refer to 1979–1990, which is too short for the present purpose. Longer series are available only for France, ranging from 1970 to 1997. This is why we consider the case of France to check the above conjecture.

The paper estimates Armington elasticities for 11 product groups. These are a subset of the 15 product groups included in the overall database. The remaining 4 groups were excluded due to inappropriate time series properties (non-stationarity). Regressions were run for 13 moving time

[1] In fact, Armington elasticities to be used in CGE models necessarily refer to commodity groups, given the usual degree of aggregation of these models.

[2] It should be emphasized that the aim of the paper is *not* to examine the comparative merits of the Armington assumption as a generic theory of import demand (on this issue see Alston et al., 1990; Norman et al., 1990 and Sawyer and Sprinkle, 1999 for an overview of import demand functions). Rather, the aim is to provide evidence on a parameter that plays a key role in general equilibrium simulations of policy reform. In this context, a well behaved, parsimonious specification such as the Armington model has distinct advantages.