International Review of Economics and Finance 35 (2015) 228–234

Contents lists available at ScienceDirect

International Review of Economics and Finance

journal homepage: www.elsevier.com/locate/iref

Importer-specific elasticities of demand: Evidence from U.S. exports

Hakan Yilmazkuday

Department of Economics, Florida International University, Miami, FL 33199, USA

ARTICLE INFO

Article history:
Received 13 March 2014
Received in revised form 4 October 2014
Accepted 8 October 2014
Available online 18 October 2014

JEL classification:
F12
F13
F14

Keywords:
Elasticity of demand
The United States

ABSTRACT

This paper investigates whether the elasticity of demand systematically changes from one importer country to another in an international trade context. Evidence from U.S. exports supports this view by suggesting that the elasticity of demand in an importer country among the products purchased from the U.S. significantly decreases in GDP per capita and distance to the U.S. of the importer country. In terms of policy implications, using a common elasticity measure would overestimate the gains from reducing trade costs with developed or distant countries and underestimate them with developing or remote countries.

1. Introduction

In the context of the static applied general equilibrium trade literature, the elasticity of demand is a key parameter that is used by policy-makers to derive quantitative results, because the effects of an international trade policy change are evaluated by the conversion of policy changes into price effects.[1] These price effects (i.e., price changes) are the key in determining the effects of trade policies on the real macroeconomic variables such as output, employment, trade flows, and economic welfare, as well as other important variables of interest. Therefore, there is no question that the measurement of the elasticity of demand is of fundamental importance in determining the response of trade models to policy experiments.

This paper investigates whether the elasticity of demand, which corresponds to the (price) elasticity of demand in the context of CES aggregators under the assumption of a large number of varieties, systematically changes from one importer country to another in the context of international trade. In terms of modeling, a partial equilibrium trade model is introduced where each country has a distinct import demand for different countries' goods (represented by a sub-utility). For instance, the United Kingdom (U.K.) has a certain demand (and a corresponding elasticity of demand) among the goods imported from the United States (U.S.), while Germany has a different demand (and a corresponding elasticity of demand) among the very same U.S. goods. The sub-demand of each importer country is represented by a constant elasticity of substitution (CES) aggregator that is a combination of goods imported from the U.S. Although the elasticity of substitution is constant for each importer, it is allowed to change across importers, which is the key to this paper.

E-mail address: hyilmazk@fiu.edu.

[1] Arkolakis, Costinot and Rodriguez-Clare (2012) show that, within a particular but important class of trade models, there exist two sufficient statistics for welfare analysis: (i) the share of expenditure on domestic goods; and (ii) the trade elasticity.

http://dx.doi.org/10.1016/j.iref.2014.10.002
1059-0560/

Using the U.S. export data (at the SITC 4-digit good category) that cover the value and unit prices of exports from the United States to 237 destination countries around the globe between 1996 and 2013, this paper shows that the elasticity of demand varies significantly across importer countries. In the benchmark case that ignores zero-trade observations, the common elasticity is estimated as about 0.90, while it ranges between 0.75 and 1.32 across importers when importer specific elasticities are considered. Similarly, when zero-trade observations are also included in the analysis, the common elasticity is estimated about 0.86, while it ranges between 0.05 and 1.51 across importers when importer specific elasticities are considered. These results are shown to be robust to the consideration of endogeneity and good classification according to Rauch (1999).

The heterogeneity of importer specific elasticities corresponds to important policy implications: Individual responses of importers through importer-specific elasticities, rather than an imposed average response through a common elasticity, should be taken into account, because each importer has its own demand characteristics. Just to give two examples, among other importers, using a common elasticity would overestimate the gains from reducing trade costs (of organized exchange goods) with Finland and underestimate them with Ukraine, both by about twofold. When the reasons behind the heterogeneity of elasticities are further investigated, it is found that importer specific elasticity estimates decrease with the development level and the distance to the U.S. of the importer country. Therefore, a common elasticity measure would overestimate the gains from reducing trade costs with developed or distant countries and underestimate them with developing or remote countries.

Compared to the existing literature, this paper is not the first one analyzing variable elasticities across importers. There are studies in which market entry affects the elasticity of demand. Most of the trade theory literature with this feature has emphasized oligopoly and homogeneous goods as in Brander and Krugman (1982).[2] The literature on pricing-to-market is another one that shows evidence for varying elasticities; this literature has shown that the same goods are priced with different markups and thus have different price elasticities of demand across importing markets.[3] For instance, Feenstra (1989) and Knetter (1993) belonging to this literature focus on the movements along the same, non-CES, demand curves so that variation in quantities caused by tariff or exchange rate shocks yields variation in the elasticity of demand. Broda, Greenfield, and Weinstein (2006) also estimate importer specific elasticities, and they surprisingly show that the median elasticities are the same across developing and developed countries by simply comparing the median estimates. However, this literature does not provide any systematic explanation for the difference in elasticities across importers. More recently, Hummels and Lugovskyy (2009) attempt to bridge this gap by showing that the elasticity of demand increases in importer GDP and decreases in importer GDP per capita. Compared to Hummels and Lugovskyy (2009), this paper shows that importer specific elasticity estimates decrease with GDP per capita and the distance to the U.S. of the importer country.

2. Methodology

A simple model is considered to motivate the empirical investigation. In particular, the international trade of U.S. exports is modeled by considering the preferences of importer countries and the profit maximization problem of U.S. producers. Since the focus of this paper is to show that using a common elasticity of demand (rather than importer specific elasticities) would lead into biased policy analysis, we consider two versions of the model, namely unrestricted (with importer specific elasticities) and restricted (with a common elasticity). In terms of the notation, for any variable X, $X_d^g(v)$ stands for variety v of good g imported by destination country d, and $\widetilde{X}$ is used for the source value of X.

2.1. Preferences of importers

We assume that the utility maximization problem of the representative agent in destination country d is separable across source countries; hence, we focus on her optimization problem for the U.S. products only for which we assume the following CES preferences:

$$C_d \equiv \left(\sum_g \left(\beta_d^g\right)^{\frac{1}{\varepsilon_d}} \left(C_d^g\right)^{\frac{\varepsilon_d - 1}{\varepsilon_d}} \right)^{\frac{\varepsilon_d}{\varepsilon_d - 1}}$$

where C_d is the composite index of U.S. products consisting of C_d^g representing U.S. good g, ε_d is the elasticity of substitution across U.S. goods, and α_d^g is a destination-good specific taste parameter. C_d^g is further given by:

$$C_d^g \equiv \left(\sum_v \left(\beta_d^g(v)\right)^{\frac{1}{\eta_d}} \left(C_d^g(v)\right)^{\frac{\eta_d - 1}{\eta_d}} \right)^{\frac{\eta_d}{\eta_d - 1}}$$

where $C_d^g(v)$ is the variety v of good g imported from the U.S., η_d is the elasticity of substitution across the varieties of U.S. goods, and $\beta_d^g(v)$ is a destination-good-variety specific taste parameter.

[2] Broda and Weinstein (2006) empirically show how elasticities change across importers. In connection with this literature, more recently, Dekle, Eaton, and Kortum (2008) have shown that there is a difference between short-run and long-run elasticities due to trade stickiness.

[3] See Goldberg and Knetter (1997) for an excellent literature review. Also see Alessandria and Kaboski (2011) for a more recent study.