



ELSEVIER

Available online at www.sciencedirect.com

SCIENCE @ DIRECT®

Mathematical Social Sciences 47 (2004) 367–387

mathematical
social
sciences

www.elsevier.com/locate/econbase

Existence of trading Nash equilibrium in tariff retaliation models

Siu-kee Wong*

*Department of Economics, National University of Singapore, 10 Kent Ridge Crescent,
119260 Singapore, Singapore*

Received 1 February 2003; received in revised form 2 July 2003; accepted 4 September 2003

Abstract

The paper considers a tariff retaliation model in which two countries set tariffs strategically in an exchange economy. In the classes of homothetic and quasi-linear preferences, I find conditions that guarantee existence of a trading Nash equilibrium. These conditions imply that the offer curves of the countries are convex to the origin, and thus, the best response function of each country is continuous. An example is also constructed to show that a trading Nash equilibrium may not exist in general.

© 2003 Elsevier B.V. All rights reserved.

Keywords: Trading Nash equilibrium; Tariff retaliation

JEL classification: F11; F13

1. Introduction

The study of tariff retaliation and trade wars in international trade theory has a long history. Most of the papers in the literature focused on the welfare implication of a trade war. Scitovsky (1942) argued that a tariff war would hurt all countries involved and possibly lead to a termination of trade. However, Johnson (1954) showed that a trade war between two countries can make one of the countries better off. The welfare implication of a trade war was further studied by Gorman (1958). Kennan and Riezman (1988) used the Cobb–Douglas utility function to show that a large country is more likely to gain in a trade war in an exchange economy. Syropoulos (2002) proved a similar result in a more general

*Tel.: +65-68746018; fax: +65-67752646.

E-mail address: ecswsk@nus.edu.sg (S. Wong).

model. Thursby and Jensen (1983) introduced conjectural variation into the model and analyzed how the change in conjectural variations affects the equilibrium. A trade war in a one-good, two-factor model in which two countries trade a consumption good and a factor of production was discussed in Cheng and Wong (1990). More recently, trade policies have been analyzed in the context of repeated game (e.g. Bagwell and Staiger (1990), Jensen (1994) and Bond and Syropoulos (1996)) and Nash bargaining (e.g. McLaren (1997)). The threat points in these models are usually Nash equilibria of some tariff retaliation models.

Despite all these analyses, some of the fundamental issues such as existence of a Nash equilibrium have yet to be studied rigorously. Apparently, Johnson (1954) noticed that the optimum consumption locus of a country could be discontinuous. However, he restricted his attention to the case of constant elasticity offer curves, thereby generating continuous optimum consumption loci. Kuga (1973) showed that a mixed strategy Nash equilibrium exists when the countries have only finite options of possible tariff rates. Otani (1980) proved existence of a Nash equilibrium in a general model based on an assumption of subjective conjecture on the curvature of offer curves. Cheng and Wong (1990) argued that differentiability of the production function guarantees the continuity of the best response functions, and thus, a Nash equilibrium exists in their model. Unfortunately, their claim is incorrect; the best response function can be discontinuous even if the production function is smooth.¹ Thursby and Jensen (1983) showed existence of a Nash equilibrium in their model by assuming constant elasticity of compensated demand and the marginal propensity to consume. Although they claimed that these variables are only assumed to be constant locally, global invariance is probably needed in their proof since existence is a global property. Syropoulos (2002) showed that the payoff function would be quasi-concave in the tariff rates if the elasticity of import increases with the domestic price of the importable. This condition restricts the preferences of the two countries in different ways as the two countries import different goods. Moreover, his analysis also rules out corner solutions which can arise when the elasticity of substitution is high.

As noted by Hamilton and Whalley (1983), it is not clear how characteristics like degree of specialization or relative sizes of the countries can be incorporated into the analysis if the model is not based on the fundamentals of the economy such as preferences and endowments. The motivation of this paper is to find conditions on preferences and endowments for existence of a pure-strategy Nash equilibrium without appealing to subjective conjecture. Dixit (1987) and Bagwell and Staiger (1990) noticed that when both countries impose prohibitive tariff, a trivial Nash equilibrium can be attained. Under what conditions a Nash equilibrium with trade exists is an open question.

In this paper, I will spell out conditions for existence of a trading Nash equilibrium for homothetic and quasi-linear preferences. These conditions are both sufficient and necessary for convexity of the negatively sloped segments of the offer curves. Thus, the optimal tariff changes continuously with the tariff rate set by the other country. The paper is organized as follows. The basic properties of the tariff-distorted demand function are discussed in Section 2. In Section 3, I investigate the conditions for existence of a trading Nash equilibrium for the classes of homothetic and quasi-linear preferences. In Section 4, I

¹See the discussion and the example in Section 3.2.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات