Economic Integration and Quality Standards in a Duopoly Model with Horizontal and Vertical Product Differentiation

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Abstract

This paper examines the effect of trade barriers on quality levels in a duopoly model for two countries where products are both vertically and horizontally differentiated. In the absence of quality regulation the producer in the large country produces a higher quality than the producer in the small country. Moreover, the quality levels between the two producers converge in case of market integration i.e. when the trade barrier is reduced. If a common minimum quality standard is introduced, which forces the low quality producer to increase the quality of his product, the high quality producer reacts strategically by lowering the quality of his product. On unregulated markets, market integration increases welfare in both countries if they are almost of similar size. However, if the countries are very asymmetrical with respect to size, market integration may harm welfare in the large country. Introducing a minimum quality standard also has ambiguous effects on welfare.

• JEL classification: F12, F13, F14
• Keywords: Vertical product differentiation, Horizontal product differentiation, Market integration, Duopoly, Minimum quality standard
I. Introduction

On markets for vertically differentiated products, product quality is a strategic variable for firms. In the pioneering work of Gabszewicz and Thisse (1979), product quality has been analyzed formally in a duopoly model based on vertical product differentiation. This analysis has been followed by a large number of analyses of determination of product quality in duopoly models. Basically, market equilibrium in these models is determined in a two-stage game between the two companies. Product qualities are determined in the first-stage game leaving prices or output to be determined in the second-stage game.

Several analyses in this tradition focus on the impacts of implementation of a minimum quality standard, which changes the quality of the products not only for the producer, who is obliged to raise his product quality level, but also for the producer, who produces above the required quality level. In a seminal paper on this issue Ronnen (1991) shows that a minimum quality standard, which effectively forces the low quality producer in a duopoly to raise his product quality, induces the high quality producer to raise his product quality too. The model of Ronnen is based on pure vertical product differentiation, Bertrand competition on prices and quality dependent fixed costs. This result was corroborated by Crampes and Hollander (1995) in a duopoly model where the variable production costs depend on the level of quality. The positive impact of a minimum quality standard on the quality level for the high quality producer also appears in case of Cournot instead of Bertrand competition; see Valetti (2000) for this result. The models referred to above all illustrate that a minimum quality standard induces the high quality producer for strategic reasons to raise quality of his product. In other respects the models diverge strongly in conclusions on e.g. welfare of countries and profit of the two producers.

Duopoly models with vertical product differentiation have also been analysed in a two country case. Boom (1995) examines the effects of implementation of asymmetric minimum quality standards for two countries i.e. the minimum quality standard differs across countries. If one of the countries chooses to keep its minimum standard above the standard of the other country, the low quality producer raises the quality of his product to be able to sell on both markets. Whether or not minimum quality standards are uniform across countries, international spill-overs are unavoidable. However, the two-country analysis of Boom only deals rudimentarily with the trade aspect. Trade costs are neglected and hence, the location of the two producers is without importance for prices, quantities