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Economic Modelling 23 (2006) 1–19

*Economic
Modelling*

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A general equilibrium model with vertically differentiated industries, skilled labour and trade[☆]

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Accepted 16 July 2005

Abstract

We present a simple general equilibrium model where one industry is oligopolistic and vertically differentiated. The manufacturing of products of a higher quality requires the employment of a larger amount of skilled labour. Given an underlying skills distribution, the model determines profits, wages and aggregate income and welfare. Results show that increasing skills endowments typically benefits the whole economy due to product quality increases and quality-adjusted price decreases. When trade opening leads to exports of the quality good, aggregate welfare increases but unskilled wage earners lose. The effects of labour taxation depend crucially on the existence of trade.

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JEL classification: D4; D5; F1; F2; J2; L1

Keywords: Vertical product differentiation; Skills; Labour productivity; Intra-industry trade

[☆] The views expressed in this paper are those of the authors and do not necessarily reflect those of the institutions they are affiliated with. This work is in part based on Lutz and Turrini (2000).

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¹ As a Senior Fellow at the Center for European Integration Studies (ZEI), Bonn, I gratefully acknowledge its continued support.

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doi:10.1016/j.econmod.2005.07.005

1. Introduction

Standard general equilibrium analysis is cast in a perfectly competitive framework, thus neglecting important features of modern industries. Giant corporations are hardly price-takers. Competition in technologically-advanced sectors does not only take place in prices, but also in all those factors that affect the level of product quality perceived by consumers (R&D, advertisement. . .). The profits accruing to some industries are a non-negligible part of national income. From a dynamic perspective, they form the incentives for investment and innovation. Perfectly competitive models miss also important aspects of current trade flows among developed countries. A large and increasing share of modern international trade takes place in differentiated goods belonging to the same sector, but perfect competition is not consistent with the observed firms' incentives to differentiate their products. Hence, a useful model to analyse economy-wide effects of endowments with skilled labour, trade opening, or taxation should be a general equilibrium one, but it should also incorporate imperfectly competitive features that are commonly disregarded in standard models.

In this paper, we develop a simple general equilibrium model to analyse the relation between some features of the labour market and the performance of a vertically differentiated, oligopolistic industry operating in an open-economy environment. There are several reasons that lead us to focus on vertical differentiation. First, vertical differentiation models permit us to capture a crucial dimension of the competitiveness of advanced industries, namely, product quality, allowing for a convenient modelling of quality competition. Second, recent empirical evidence shows that vertical differentiation is at the heart of current developments of intra-European trade. European intra-industry trade (IIT) in vertically differentiated goods has increased significantly during the last decade, while IIT in horizontally differentiated varieties has been stagnating.⁴ Empirical evidence also shows that differences in factor endowments are positively related with the share of IIT in vertically differentiated goods across European countries.⁵ This leads to the presumption that the market determinants of vertically differentiated industries are to be studied in a general equilibrium framework, something that is missing in standard imperfectly competitive models.⁶

Empirical research indicates that the availability of skilled labour within a country influences the level of product qualities and the resulting international market position of domestic industries.⁷ Consistently, we assume in our model that producing higher quality products requires a higher amount of skilled labour.⁸ In order to analyse currently debated

⁴ See, e.g., Fontagné et al. (1995, 1997, 1998).

⁵ See Fontagné et al. (1997, 1998).

⁶ See, e.g., Gabszewicz and Thisse (1979), Shaked and Sutton (1982).

⁷ Mason et al. (1996) present cross-country evidence that endowments with vocational skills tend to affect quality levels in several national industries. Courakis (1991), Oulton (1996), Torstensson (1996), Jansen (1997), Jansen and Landesmann (1999) present results indicating that countries with high endowments in skills trade high qualities in intra-industry trade. Kraay and Ventura (2001) show how international differences in skilled labour endowments may give rise to different national business cycles.

⁸ We do not explicitly model collective bargaining and similar labour market aspects. For a review of relevant empirical microeconomic aspects of aggregate labour markets, see Bertola (1999).

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