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Productivity, resource endowment and trade performance of the wood product sector

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ABSTRACT

This paper analyzes the determinants of international trade of wood products, considering three main groups: woodworking products, pulp and paper and wooden furniture. We extend the Heckscher-Ohlin-Vanek (HOV) framework in order to take into account the forest resource endowment as well as industrial performance factors. Empirical tests are based on data on European countries between 1995 and 2007. The HOV hypothesis is partially confirmed in that the forest resource endowment is a significant determinant for explaining differences in net trade of two products (pulp and paper and furniture) but not for woodworking products. In addition, empirical tests also show the limits of the HOV model for explaining international trade of wood products. Indeed, factors reflecting industrial performance of wood sectors, including total factor productivity and average labor cost, have a significant role in determining differences in net trade of wood products.

Introduction

From an economic viewpoint it may be paradoxical that countries with similar forest endowments have quite different trade balances for wood products. An important part of the literature still explains international trade between countries by differences in endowment of production factors using the

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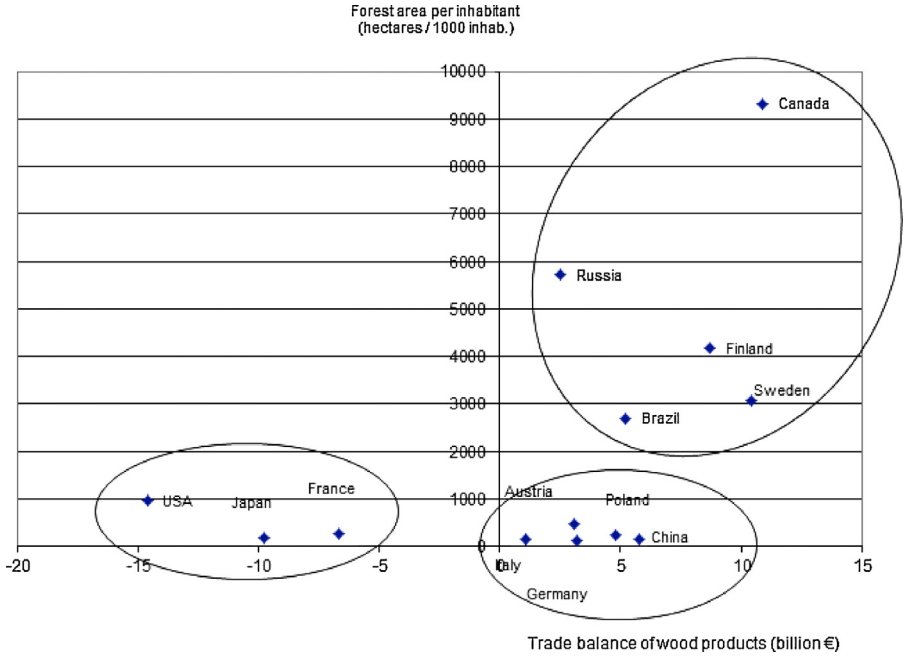

Fig. 1. Trade balance and forest area.
Data sources: UN Comtrade and FAO 2010.

Heckscher-Ohlin model (Krugman et al., 2011). More precisely, countries for which the required production factors are relatively abundant have comparative advantages in the production of those goods, and therefore export them (Heckscher, 1919; Ohlin, 1933). The multi-factor and multi-product framework has been developed by Vanek (1968) and is known as the Heckscher-Ohlin-Vanek (HOV) model. In the forest-based sector, the HOV model predicts that a country with relatively more abundant forest resource will also have larger net exports of wood products other things being equal (Prestemon and Buongiorno, 1997).

However, if we consider the main exporting countries of wood products, it appears that there is no systematic correlation between the forest resource and the trade balance of wood products (see Fig. 1). At a comparable level of forest resource (measured in hectares per inhabitant), some countries benefit from a positive trade balance of wood products (Germany, Austria, Italy, etc.) whereas others suffer from a deficit (France, Japan, USA). This paradox is comparable to the one discussed by Leontief, which took about three decades to be understood by economists (see Feenstra, 2004 for a literature review). One solution to the paradox has been provided by Leamer (1980) who proposed a correct statement of the link between trade and factor endowments using the HOV model. A second solution allowing a better understanding of the determinants of trade was to introduce industry specific heterogeneity across countries (Trefler, 1993; Davis and Weinstein, 2001). We follow these recommandations, and propose a model explaining the trade balance for wood products as a function of forest resource endowments, but also time and industry specific variables. Our main purpose is to shed new light on why countries with comparable forest resources have different trade performances.

Compared to the existing literature (Bonnefoi and Buongiorno, 1990; Lundmark, 2010; Prestemon and Buongiorno, 1997; Uusivuori and Tervo, 2002), our empirical analysis considers the forest resource endowment for explaining international trade of wood products, but also other factors with particular emphasis on the industrial performance indicators. Furthermore, this paper considers processed and finished wood products (woodworking products, pulp, paper and paperboard, furniture) whereas, so