Forestry industry trade by degree of wood processing in the enlarged European Union countries

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ABSTRACT

This paper analyses the forestry industry trade of the New Member States (NMS-11) of the European Union (EU) on the enlarged EU-27 markets, focusing on three groups of wood products: raw wood, semi-finished and finished wood products in the 1999–2010 period. The best performing NMS-11 country in the forestry industry trade with the enlarged EU-27 is Cyprus with a trade surplus mostly based on finished or at least semi-finished wood products. The results suggest a convergence in the forestry industry trade specialisation of the NMS-11 countries. A significant variation in the mobility of the forestry industry trade specialisation is found, but with a deterioration in forestry industry trade specialisation patterns over time. The results suggest the crucial role that the wood-processing and furniture industries can play with finished wood products and their backward linkages to raw wood and semi-finished wood products for forestry industry competitiveness. Forestry industry management should focus on better quality and greater trade competitiveness in the vertical wood industry supply chains from lower to higher value-added and marketed wood products.

1. Introduction

Forestry industry trade in raw wood and semi-finished wood products has represented one of the single most important traded agro-food and forestry industry products from the New Member States (NMS) from the Central and Eastern European (CEE) countries to the old member states of the European Union (EU-15) (Bojnec and Fertő, 2007a, 2007b). As argued by Bojnec and Fertő (2011), for the forestry industry trade in raw wood and semi-finished wood products of Hungary and Slovenia with Austria, the NMS from the CEE countries might export to the EU-15[1] lower value-added raw wood and semi-finished wood products and, vice versa, import higher value-added processed wood products. Thus far, there has not been any evidence on the forestry industry trade of differentiated wood products for the Mediterranean NMS (Cyprus) and on trade competitiveness for the forestry industry by raw wood, semi-

finished and finished wood products on the enlarged EU-27 for the NMS-11.[2]

We investigate what has happened to the forestry industry trade flows in the NMS-11 countries that joined the existing EU-15 countries. There is a wealth of literature on the impacts of specialisation on countries' export performance. The theoretical literature on growth and trade predicts that a country's comparative advantage is a dynamic concept and develops endogenously over time. The growth rate of a country might be permanently reduced by a 'wrong' specialisation (e.g., Grossman and Helpman, 1991; Lucas, 1988; Young, 1991). Another strand of research emphasises the role of factor accumulation in determining the evolution of international trade (Deardorff, 1974; Findlay, 1970, 1995). Based on different theoretical predictions, there is increasing empirical literature on trade dynamics. Research on industrial countries finds a strong persistence of comparative advantage (e.g., De Benedictis and Tamberi, 2004; Redding, 2002), whilst there is contrary

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[1] The following countries are considered to be the EU-15: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

[2] The following countries are considered to be the NMS-11: the NMS-9 from the EU enlargement on the 1st of May 2004 (the Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia) and the NMS-2 from the EU enlargement on the 1st of January 2007 (Bulgaria and Romania). In addition, Malta, which joined the EU on the 1st of May 2004, is the NMS-12. It has been identified as an outlier in the empirical analysis with relatively small or no trade in raw wood base, neither from domestic forestry base nor from imports and with relatively larger trade in semi-finished and finished wood products. This is the reason that Malta is excluded from the presented results in this paper, so that instead of the NMS-12, the presented results are for the NMS-11 countries.

evidence, i.e., relatively high mobility in trade specialisations for CEE countries (e.g., Bojnec and Fertő, 2008; Fertő and Soós, 2008; Zaghini, 2005).

The aim of this paper is to investigate, via the application of various empirical approaches, whether the NMS-11 countries have recently changed their specialisation in the forestry industry trade by the degree of wood processing. The main methodological assumptions of the research are that the relative comparative trade advantage (RTA) index is a close approximation of the forestry industry trade competitiveness for the NMS-11 countries on the enlarged EU-27 markets, which is used as a benchmark of relative comparison. Among the main limitations of the research is the omitted NMS-11 forestry industry trade with the rest of the world outside the EU-27. This would require a new calculation and comparison of the results, using the world trade as the benchmark of comparison for the NMS-11 trade both in trade with the EU-27 countries and in trade with the countries in the rest of the world. The situation is similar for presented calculations, which are based on a single year and not on the basis of contiguous years and an average of a number of years, and thus might be biased to trade oscillations by individual years, particularly for smaller countries.

This paper contributes to the literature on the forestry industry trade between the NMS-11 and the enlarged EU-27 markets in the following four directions: first, it provides an empirical analysis of the forestry industry trade by raw wood, semi-finished and finished wood products for the NMS-11 on the enlarged EU-27 markets before and after the EU-27 enlargement. Second, following the previous literature (Dieter and Englert, 2007), which analysed the competitiveness of Germany in the global forest industry sector, this paper contributes the empirical analysis of the RTA index as a competitiveness measure for the NMS-11 on the enlarged EU-27 markets by the degree of wood processing. Third, unlike any previous studies, this paper contributes a duration analysis of the relative comparative trade advantage or relative comparative trade disadvantage pattern and mobility between different RTA states. Finally, it derives forestry, wood processing, marketing, and wood supply chain implications for international competitiveness in the forestry industry trade for raw wood, semi-finished and finished wood products.

2. Literature review

Toppinen and Kuuluvainen (2010) provide a review of literature on forest sector modelling in Europe focusing on econometric research on forest sector markets (demand and supply modelling, market integration, forecasting forest sector markets and prices, industry location, and factor demand, substitution and technical change) and the application of the forest sector models with a synthesis of research and conclusions for studying the forest industry and forest product markets. Only a smaller number of studies have been related to the forestry industry trade.

Bonnefoi and Buongiorno (1990) analysed the 'revealed' comparative export advantage (RXA) index of the forest products trade. They find its positive relation with a country's net trade, extensive forest resources and other resources, and income or domestic demand. For countries with negative RXA in their total forest products trade, they identify three sub-groups in relation between forest resources relative to domestic demand. The relation between RXA, forest resources and demand was tested with an empirical model, which explained a large part of the variation in the net trade of five commodity groups: round wood, sawn wood, wood-based panels, wood pulp, and paper and paperboard, between the early 1960s and 1980s. They find a strong positive relation between net trade and wood availability, and a strong negative relation between net trade and level of domestic demand, reflected by income.

The previous studies on the forest sector development in the NMS-11 have focused on different aspects of the forestry industry development and different aspects of CEE countries' forest industry development, institutional changes and forest industry supply chain management.

Kangas and Niskanen (2003) analyse trade in forest products between the EU and the CEE accession candidates. Toppinen et al. (2005) investigate dynamics of round wood prices in Estonia, Finland and Lithuania. Hänninen et al. (2007) analyse the pass-through of sawn wood and saw log prices between the new (Estonia and Czech Republic) and old EU member countries (Austria and Finland) as exporters to German markets. Whilst the transmission process differed between countries, price transmission exhibited similarities between old and new EU member countries and convergence in sawn wood and saw log prices. Using qualitative analysis, Brodrechtova (2008) investigates factors influencing export marketing strategies in the Slovakian forest products industries.

Liberalisation of trade with the tariff reductions most likely affected the commodity composition of world wood trade with a shift from raw materials to more processed products (Zhu et al., 2001). Dieter and Englert (2007) analyse the global competitiveness of the German forest industry sector against the international timber markets according to the three processing levels: raw wood, semi-finished and finished wood products. They employ two competitiveness indicators: first, the revealed comparative advantage by using the means of the Balassa index and Aquino index; second, the constant market share by disaggregating the overall export growth of a country into four different effects: the world growth effect, the commodity-composition effect, the market-distribution effect, and a residual interpreted as the competitiveness effect. The highest Balassa index values are shown by Russia for raw wood, by Finland for semi-finished wood products, by Poland and to a lesser extent for Germany for finished wood products in global timber markets. The Aquino index confirms that countries that are specialised in timber commodity exports are also significant timber importers, which is an indication of an intra-industry trade. The constant market share analysis suggests that the leading timber exporters in absolute terms experienced low export growth rates, and vice versa. They identify a strong positive relationship between a country's timber export growth rate and its competitiveness effect. Most of the Eastern European countries show this pattern with high growth rates and high positive competitiveness effects. One striking finding was that Germany's export growth has been driven more by the overall world growth in timber markets than by the German forest industry sector.

Bojnec and Fertő (2011) investigate the price, quality, and non-price competition of Hungarian and Slovenian trade in raw and semi-finished wood products with Austria. In matched two-way trade in similar products, Hungary is shown to have experienced surpluses at lower export-to-import unit values, whilst Slovenia has had a deficit at higher export-to-import unit value.

The sustainable development of the forest sector chains is seen as an important factor in different value-adding wood production and wood supply chains and in providing other ecosystem services covering the environmental, economic and social aspects of sustainable development (Päivinen et al., 2012). Public policies with institutional quality can be considered to be an additional dimension essential for achieving the sustainable development of forestry–wood chains.

This paper adds to the literature on the forestry industry trade between the NMS-11 with the enlarged EU-27 markets in the following four substantial directions: first, in comparison to Kangas and Niskanen (2003), by an updated, widened and deepened analysis of the forestry industry trade between the NMS-11 and the enlarged EU-27 markets before and after the EU-27 enlargement; second, in comparison to Dieter and Englert (2007), Han et al. (2009) and Bojnec and Fertő (2011), by the focus on the RTA index in the forestry industry trade competitiveness and in the RTA patterns; third, the Kaplan–Meier estimator of the survival function, non-parametric log-rank test, different unit root tests for panel data analysis, Markov transition probability matrices and mobility indices are introduced in the forestry industry trade analyses. Finally, the officially reported forestry industry trade is analysed. China, Brazil and Russia are likely to play predominant roles in the use of illegally harvested timber (Dieter, 2009). In the cross-border areas between some NMS-11 and between the NMS-11 and the