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Trade flows, unit prices and roundwood market integration in northern Europe

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Abstract
Roundwood markets in Northern Europe have changed significantly due to the enlargement of EU in 1995 and 2004, and the formation of a common currency union between the 12 EU countries in 2001. However, wider research on the larger context of interaction between national markets in European Union is yet largely missing. This study shortly assesses roundwood market development and integration in Northern Europe. First, international roundwood and chips trade is studied by using simple descriptive analyses and annual national data from EFI's and FAO's databases for coniferous roundwood trade in 1980-2004. We classify countries as net importers or exporters of roundwood and examine how the trade flows have evolved over time. Second, we explore how the unit values of the roundwood and chips exports and imports have developed during 1980-2004, and explore signs for deepening integration of the roundwood markets in terms of convergence of unit prices and price variances. The results indicate that coniferous roundwood trade has been mainly moving from east (Russia, Baltic States) to west (Finland, Sweden, Norway), even though there has also been a small trading centre around Austria. The unit price development reveals that national export and import prices have clearly converged during the last decade.

Key words: Roundwood trade, coniferous, Northern Europe, integration, unit prices

Introduction

During the 1990s roundwood trade in Northern Europe increased significantly. This increase is mainly due to the large structural changes in the operational environment of forest industry. Especially, the enlargement of European Union with its harmonised legislation and regulation dealing with international trade of products as well as competition legislation has been among the main factors to affect national roundwood markets in Northern Europe (Toppinen et al. 2005). The forest area and forest industry production of the EU almost doubled when Finland, Sweden, and Austria joined EU in 1995. The integration of national wood markets continued in 2004, when ten more countries joined in EU, and three countries are still in pipeline to join in 2007. Also, the collapse of Soviet Union in the beginning of 1990s resulted in a large increase in roundwood exports especially to Finland and Sweden (Mutanen et al. 2005), along with the investment boom in the sawmilling industry.

In order to understand how these structural changes have affected roundwood markets in Northern Europe, how national roundwood markets in different countries are functioning, and to evaluate the degree of integration between these markets, it is essential to analyse the change in volumes and prices of international roundwood trade. Theoretically, integration of roundwood markets can be analysed with the law of one price (LOP), which address that in competitive markets without trading costs a homogeneous commodity has a single price irrespective of the country of origin. As Silvapulle et al. (1994) and Toivonen et al. (2002) have stated, two regions then belong to the same competitive market if the local price of homogeneous product differs only by transportation costs between the regions.

Recently, only a few studies have been carried out to analyse the international trade of roundwood. Thorsen (1998) and Nyrund (1999) examined the Nordic roundwood markets and found that countries with highest forest industry capacities, i.e. Finland and Sweden, are also price leaders in the markets. Integration of roundwood markets in Austria, Finland and

Sweden was studied by Toivonen et al. (2002) who found that the LOP holds between the two Nordic counties, but a clear price co-movement did not exist between Austria and Nordic countries. Mäki-Hakola (2002, 2004) tested roundwood market integration between Finland, Estonia, Germany, and Lithuania. He found out a strong connection of sawlog prices between Finland and Estonia. Furthermore, using standard convergence tests Toppinen et al. (2005) found only weak evidence for long run equilibrium delivery price levels between different Finnish, Estonian and Lithuanian wood assortments.

Using simple descriptive methods, this study analyses the development of international trade of roundwood in Northern Europe. We focus only on studying the development of exports and imports of coniferous roundwood and chips in terms of their volumes and prices, because coniferous assortments and saw residues are the most important wood articles for the forest industry in Northern Europe. Especially, we analyse which countries have been the main importers and exporters of roundwood in Northern Europe, and how these trade volumes have evolved over the period from 1980 to 2004. As a whole, this paper is a preliminary study as a background for oncoming analyses of roundwood market integration in Northern Europe.

Materials and methods

Annual export and import data of roundwood was obtained from European Forest Institute's (EFI) database (see also Michie & Wardle 1998) and from bilateral trade matrices of FAOSTAT. The time span is from 1980 to 2004. The series contain export and import volumes and unit prices of coniferous industrial roundwood and chips and particles. The countries included in this study are Finland, Sweden, Norway, Russian Federation, Czeck Republic, Poland, Germany, Austria, Belarus, Estonia, Lithuania, Latvia, Ukraine and Slovakia.

Results

Exports of Coniferous Roundwood

The drastic societal changes in Europe affected considerably both national and international operational environment of forest industries as well as their wood procurement strategies in Northern Europe. The unification of Germany, the collapse of Soviet Union and the gradual privatisation of the forests of the Baltic States after their declarations of independence integrated the former national forest resources into international markets. Also, the European Union with its harmonised legislation and regulation dealing with international trade of final products and inputs have affected strongly on the internationalisation of roundwood trade.

Fig. 1 illustrates the development of export volumes of coniferous roundwood from 1980 up to 2004.1 As can be seen from the Figure, USSR was the largest exporter of coniferous roundwood before its collapse. While Finland and the Soviet Union had bilateral trade contracts during 1980s, most of the volumes from USSR were exported to Finland as a part of the contracts. Up to 1987, the export trend of all studied countries is rather constant. Annually, USSR exported about 0.75 million cubic meters of coniferous roundwood whereas other countries exported less then 0.2 million m^3. During the period 1988 – 1989 the export volumes of all countries raised. USSR exported almost all 3.5 million m^3 but due to the collapse of the Soviet economy, the exports of coniferous roundwood temporarily decreased.

1 Throughout this study, the figures represent only those of documented in FAOSTAT and EFI. The statistics given e.g. in Finnish Statistical Yearbook of Forestry and other national sources can differ slightly from these figures.

However, soon after the collapse of Soviet Union, the export volumes of coniferous roundwood increased significantly. The forest enterprises in Russia were willing to export roundwood to finance their domestic activities and investments and to avoid bankruptcy (see Vinokurova et al. 2005 and Mutanen et al. 2005 for more details). In Northern Europe, Russian Federation has clearly been the most important exporter of coniferous roundwood. In 1999, the exported volume from Russian Federation was above 8 million m^3, and recently the volumes are slightly less than 10 million cubic meters.

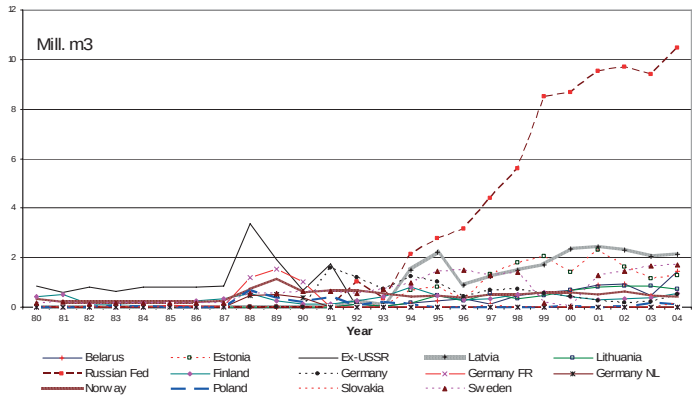

Figure. 1 Export volumes of coniferous roundwood, 1980 – 2004

Also, the Baltic States have participated intensively in international coniferous trade after their declarations of independence. Especially, Latvia and Estonia have exported considerable amounts of coniferous roundwood mainly because a substantial pulpwood based forest industry does not exist in these countries. The annual export volumes of both countries have moved parallel between 1 and 2 million m^3. The export of other countries during the period 1992 – 2004 was below 1 million m^3.

Imports of Coniferous Roundwood

During the period from 1980 to 2004, Scandinavian countries Sweden, Finland and Norway have been the major importers of coniferous roundwood. As can be seen from Fig. 2., the import volumes started to increase in the late of 1980s mainly due to the institutional reasons mentioned above. However, also changes in national operational environments created incentive to increase international trade of roundwood. For example, in Finland the centralised roundwood market contracting, giving strict rules for roundwood prices as well as for volumes of imports was gradually removed between the late 1980s to the mid 1990s. However, the import volumes did not increase significantly until the collapse of Soviet Union. The incentive for the Scandinavian firms, especially in Sweden and Finland, was undoubtedly the relatively cheap wood material and good logistics through close geographical location. Sweden also imported considerably amounts of coniferous pulpwood from the Baltic States.

During the period 1992 – 2004, the imported volume of coniferous roundwood to Sweden and Finland increased in parallel even though the import volumes to Sweden were slightly higher than to Finland. In 2000, Sweden recorded the largest volume of about 8.5 million m^3. From 2000 onward, the imported volumes of coniferous roundwood have slightly decreased mainly due to the decreased supply and increased prices of logs from Russia. After

the increase in the early of 1990s, Norway has consumed rather constant import volumes of about 2 to 3 million m^3.

The other countries in Northern Europe have also imported coniferous roundwood, but the volumes have been negligible in comparison to Sweden, Finland and Norway. However, after the year 1995, other countries have also slightly increased their import volumes. Evidently, the main reason for this is the enforcement of competition legislation of European Union with its harmonised rules and regulations dealing with the international trade of products and inputs. In 1999, Germany crossed the threshold of one million cubic meters of imports, while other countries reached the half million m^3 of imports.

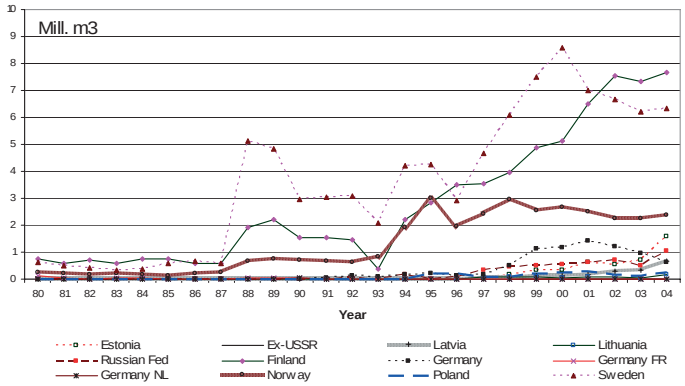

Figure. 2. Import volumes of coniferous roundwood, 1980 – 2004

To get a better understanding about the coniferous trade in Northern Europe, Fig. 3. depicts the trade flows in 2003. From this Figure as well as from the previous Figures, it is clear that the main wood flow originates from Northwest Russian to Scandinavian countries. However, two other concentrations can be found around the Baltic States and in Central Europe, especially around Austria.

The coniferous export from Estonia and Latvia to Finland, Sweden and Norway has been rather significant. As discussed shortly above, these export volumes consist mostly of pulpwood. Because of the investments in sawmilling industry and recent lack of coniferous logs, Estonia has also imported logs from Russia. Traditionally, some border trade of coniferous wood has been from Sweden to Norway. Sweden, Russia and the Baltic States also export smaller quantities to Germany. The marketing of industrial roundwood from Germany, Czech Republic and other neighbouring countries to Austria is also significant in central Europe.

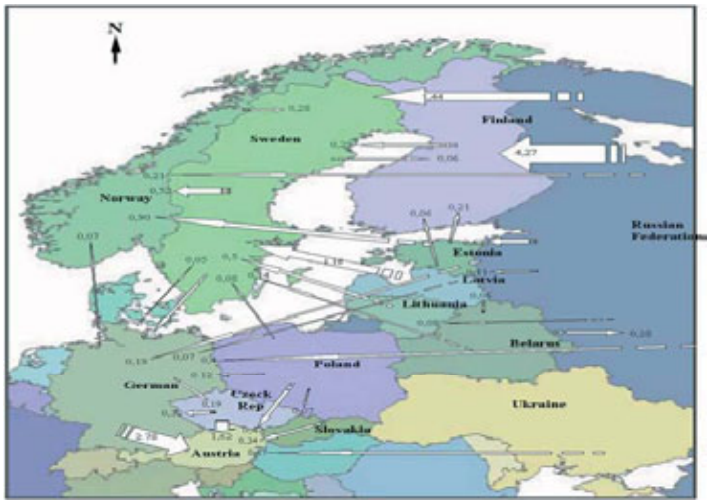

Figure. 3 Trade flow map of coniferous roundwood in Northern Europe in 2003, mill. m3

Germany differs from the other countries by engaging in both exports and imports of roundwood. Though Germany is an exporter of coniferous roundwood, it also imported from Sweden, Czech Republic and other neighbouring countries. At the same time, it is significant exporter to Austria. The reason for this can be understood through the logistics. Because of the location of the wood processing industry and the low custom tariffs, it would be profitable to export coniferous roundwood from some parts of the country rather than consume it in domestic plants which may be able to import roundwood for their own special needs.

Chips and Particles

The trade of chips and particles as a wood residue is closely connected to the location of sawmills and pulp and paper industry. Nowadays, because of the vertical integration strategies of the forest industry and the competition legislation of the European Union, national boarders are no longer barriers to trading raw material from one country to another.

Fig. 4. depicts the development of trade of chips and particles during 1980 – 2004. Prior to the institutional changes in Europe in the beginning of the 1990s, the most important exporter of chips and particles was Sweden. The annual volumes fluctuated around the half million cubic meters until 1990 and after that the trade has averaged approximately 0.3 million m3. Due to the absence of the pulp and paper industry and large investments in sawmilling industry, the Baltic States have become more active in trading chips after the mid of 1990s. Especially, Latvia has increased its export volumes considerably after 1996. In 2003, Latvia exported 1.82 million m3, which was twice as much as exported from Estonia and more than three times higher than exports from other countries. The trend of Estonian exports has been similar to that of Latvia, but the exported volumes have been significantly lower. The exports of chips and particles from Russia grew only slightly up to 1999, but in 2000 it increased its export volumes to about 0.5 million m^3. Exports from Sweden have also been rather constant with annual volumes of about 0.3 million m3. Exports from other countries have been annually less than 0.1 million m^3.

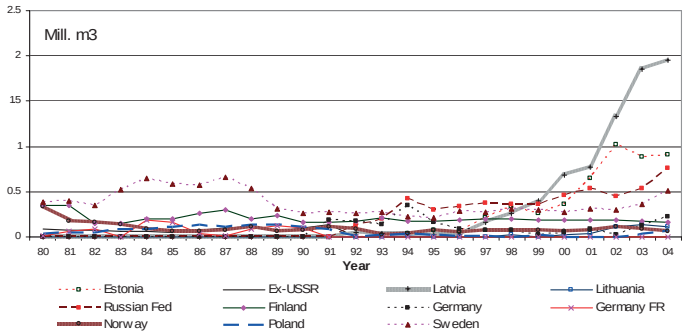

Figure. 4 Export volumes of chips and particles, 1980 – 2004

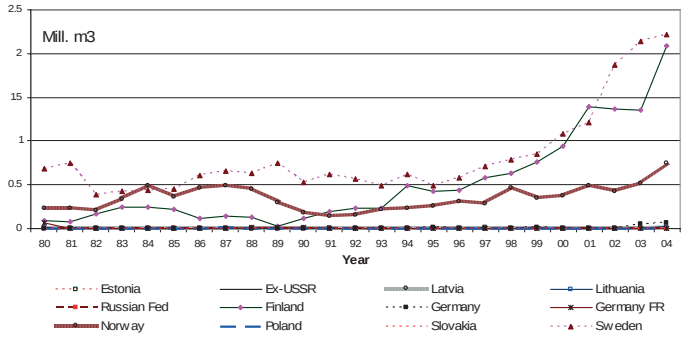

Figure. 5 Import volumes of chips and particles, 1980 – 2004

The total imports of chips and particles in Northern Europe and the Baltic Sea area in 2004 amounted to 10.52 million m^3, which was 13.4% higher than in 2003 and 27.2% higher than in 2000. Thus, the trade of chips and particles is following an upward trend. As can be seen from the Fig. 5., Sweden, Norway and Finland have been the major importers of chips and particles. The other countries have only a negligible role in chips and particles imports. It is however noteworthy that while Sweden and Finland have considerably increased imports of these pulp articles, Norway has only slightly increased the import volumes. The imports of these three countries moved more or less parallel over the period from 1980 to 1998 even though Sweden imported higher amounts than Norway and Finland. The reason for this increase is related to increased export volumes from Latvia. Imports into Finland continuously increased up to about 1.35 million m3 in 2001, and have remained rather constant since then.

Figure. 6 Trade flow map of chips and particles in Northern Europe in 2003, mill. m3

In the case of chips and particles, trade flows are mainly moving in the Northwest direction, as presented in Fig. 6. Latvia was the most important exporter of chips and particles in 2003. It exported to Sweden, Finland, Norway and also to Germany. The trade from Estonia and Russia to Finland is also considerable. A smaller but locally important trade has occurred around Austria and Czech Republik.

Unit Price Development of Coniferous Roundwood

The simplest way to analyse roundwood market integration in Northern Europe is to observe the development of import and export unit prices of industrial coniferous roundwood. If the unit prices are converging over time, or if the price fluctuations appear with a lower standard deviation, then one can suspect deepening market integration. As lower unit price development typically means more competition between buyers, this would be another sign of increased market integration.

Fig. 7. depicts the development of unit prices of exported coniferous roundwood. As can be seen, prices fluctuated widely until the mid 1990s. However, it is difficult to explain the large peaks in the series other than as errors in statistics. For example, the unit price for exports for BRD in 1983 can be due to the biased observation rather than huge increase in prices. Interestingly, the prices seem to fluctuate more consistently after 1994 with the exceptions of Sweden and Estonia, where the price development can be explained by changes in national market environments. Clearly, prices have followed a decreasing trend until 2001 after which there is a modest increase.

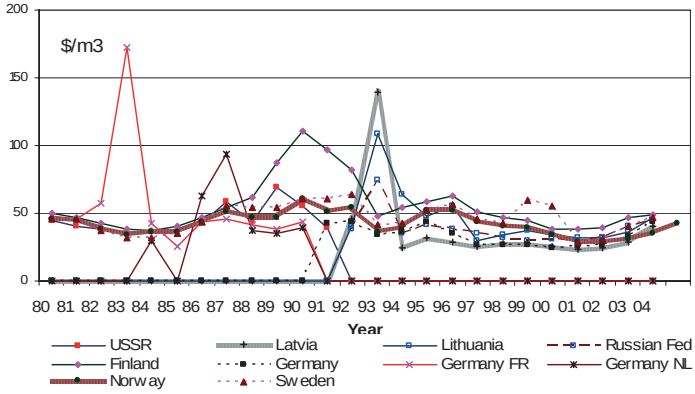

Figure. 7 Unit prices of exported coniferous roundwood, 1980 – 2004

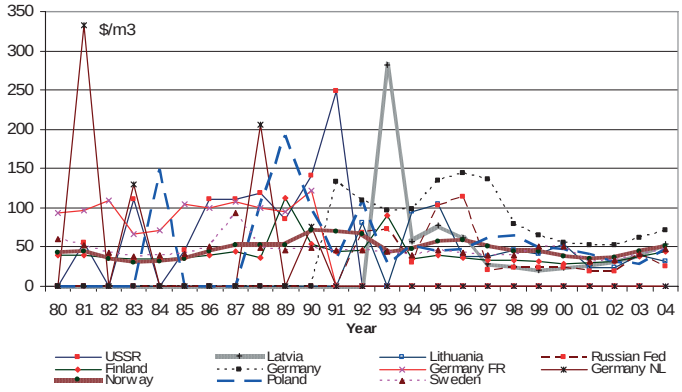

Figure. 8 Unit prices of imported coniferous roundwood, 1980 – 2004

The development of unit prices for coniferous imports is consistent with the behaviour of export unit prices. According to Fig. 8., the convergence of the prices is evident after the mid of 1990s indicating an increased international competition of roundwood and market integration.

Conclusion and Discussion

Along with the general globalisation and structural societal changes in Europe, the operational environment of forest industry has changed remarkably, and international trade of wood has experienced manifold increases. Using simple descriptive analysis and annual data from 1980 to 2004, this study briefly explored the development of coniferous roundwood and

chips and particles trade flows, identified major importers and exporters during the last two decades and analysed the direction of market integration in Northern Europe.

Results reveal that imports and exports of industrial coniferous roundwood and chips and particles started increasing in the early 1990s. During the past decade, volumes of both imports and exports have increased continuously. Industrial coniferous roundwood trade flows move mainly from east to west. The largest volumes of coniferous roundwood are imported into Finland, Sweden and Norway especially from the Russian Federation, but also from Latvia and Estonia. Sweden is the main importer of chips and particles in Northern Europe, even though Finland and Norway have increased their import volumes as well. Latvia is the main exporter of chips and particles. Based on trade volumes, the Baltic Sea area constitutes an internal market for roundwood and chips. A small separate market of coniferous roundwood and chips and particles trade is concentrated around Austria.

The price analysis confirms that unit prices of coniferous roundwood and chips in the Northern and Central Europe are co-moving, converging or both, which ultimately indicates that the roundwood markets in Europe are becoming increasingly integrated. This finding is consistent with Nyrud et al. (2004), who found that the prices of forest products in global markets are co-moving. However, even though there are some differences between the national prices of imports and exports, they are likely to be derived from different transportation costs or from differences in wood quality. In the case of coniferous roundwood, the import and export prices between the countries are much closer than in the case of chips and particles prices. Nevertheless, the development of imported unit prices for chips and particles between the major importers seems parallel.

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