The Organisation of the European Intermodal Road/Rail Freight Transport Industry

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Authors
Chalmers University of Technology, Department of Transportation and Logistics
SE-412 96 Göteborg, Sweden, Tel.: +46-31-772 1339, E-mail: jwox@mot.chalmers.se
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Abstract

Intermodal road/rail freight transport is by many regarded as the universal solution to a wide range of problems related to road freight transport as well as to the financial problems of national railways. The high expectations, in particular from the political actors, have not been fully fulfilled although the industry has shown substantial growth over a number of years. The reasons for the somewhat disappointing development is by many considered to be related to the industrial organisation. Still, a lack of contemporary analysis of the industrial organisation of intermodal freight transport is identified.

This article attempts to add to the knowledge of how intermodal transport chains are organised in the era of deregulation that at least applies in parts of Europe. Special effort is spend on an attempt to identify actor categories and principles for how they cooperate in the production and marketing of intermodal transport services.

An overview for Europe is presented together with a more detailed description of the situation in Sweden that has a history of deregulation since 1988 when the infrastructure management was broken out of Swedish State Railways. The ambition is to show the basic structure of the intermodal transport industry rather than extensively describe every detail. The European overview covers door-to-door transport while the Swedish one covers the core of intermodal transport: terminal-to-terminal.

On the European level, national container companies offer door-to-door services and, together with shipping agencies and forwarders, they control the very important contacts with the shippers. The ICF and the UIRR companies take a wholesaler role, although ICF occasionally sell directly to large shippers. In international transport, the forwarders decide whether intermodal transport should be used but the hauliers take a stronger role in domestic transport since they are then often contracted for a long distance haul and can in turn outsource to an intermodal operator. Shippers rarely specifically demand a special transportation mode.

In all, it is obvious that changes due to deregulation take place in the European intermodal road/rail freight industry. Some cherry-pickers have entered, some of them have left, while others maintain and develop their place in the market. Above all, however, the large players change strategies, enter new markets or form alliances which give much faster and more dramatic changes as well as a more scattered picture than in the monopoly days.

In general, the new intermodal operators are found in the northern part of Europe and in particular in the large market for hinterland transport of maritime containers. Hence, most of them can be related to the large ports in Hamburg, Bremerhaven, Rotterdam and to some extent Antwerp. A clearer actor role concerning rail traction is also distinguishable with many small rail companies, often with a short-line origin.

In Sweden, the biggest change is that Green Cargo (former freight division of Swedish State Railways) has merged its subsidiary for intermodal transport, Rail Combi, with NSB Freight (now CargoNet A/S), that some private railways have started shuttles for maritime containers to Göteborg and that the furnishing company IKEA has started an own railway company controlling slots and coordinating traffic, however with outsourced physical movement.

The Organisation of the European Intermodal Road/Rail Freight Transport Industry
1 Introduction

1.1 Background

Intermodal road/rail freight transport is by many regarded as the universal solution to a wide range of problems related to road freight transport as well as to the financial problems of national railways. The high expectations, in particular from the political actors, have not been fully fulfilled although the industry has shown substantial growth over a number of years. The reasons for the somewhat disappointing development is by many considered to be related to the industrial organisation.

Researchers and consultants have directed much attention towards the quantitative and qualitative as well as real and potential demand for intermodal transport in Europe. Less effort has been spend on analysing the supply side of intermodal transport, although a number of studies have been published (e.g., Bukold, 1993/a, 1993/b and 1996; Cooper et al., 1991; Stone, 1998 and Woxenius, 1994). These studies are some years old now and substantial changes in the marketplace have resulted in a lack of contemporary analysis. This article attempts to add to the knowledge of how intermodal transport chains are organised in Europe.

1.2 Objectives and scientific contribution

A part of an ongoing research project on intermodal freight transport\(^1\) is dedicated to possibilities for the rail traffic mode to offer spatially dispersed services. The overall aim of the article is to build a base for such continued research. The empirical purpose of the article is to describe and analyse the characteristics of the European intermodal transport industry. The leading empirical research questions are:

- Which categories of companies take part in the production of intermodal road/rail freight transport services?
- Which are the main European actors?
- How and by which actor categories are these services packaged and offered to the European shippers?

The scientific contribution is believed to be mainly empirical but also the division into actor categories for describing the industry might be fruitful for other types of market analyses.

1.3 Methods

The article is based upon the systems approach as presented by, for instance, Churchman (1979). In previous own theoretical work (Woxenius, 1994 and 1998), this approach and the actor approach (the Uppsala school of thought) has been used for developing a three element approach. The elements actors, activities and resources

\(^1\) The Thematic Programme Intermodal Freight Transport is carried on at Department of Transportation and Logistics at Chalmers University of Technology and at School of Economics and Commercial Law at Gothenburg University. The programme is financed by VINNOVA (Swedish Agency for Innovation Systems), the Swedish National Rail Administration and the Swedish National Road Administration.
have been found useful as starting points for analyses with different purposes. The application here is devoted to the structure of the intermodal transport industry, accordingly starting out from the actor categories. Taking an activity approach might also have been feasible and would certainly have ended up in another type of analysis. Since the industrial organisation and not only the phenomenon intermodal road/rail freight transport is the object of study, an actor perspective was, however, regarded as more fruitful. The result of the analysis is a table describing the industry.

The empirical foundation for the description and analysis is an extensive study carried out in 1994 (Woxenius, 1994), which was updated in 2000 (Woxenius, 2000). The 1994 study was based upon 20 structured interviews with officials of intermodal transport companies, forwarders, terminal companies and shippers as well as knowledge incrementally gathered during other research efforts.

The update in 2000 and the subsequent update and revision in the present article are based upon information in trade journals, at internet sites and by informal interviews with industry representatives along with continuous coverage of the industry while addressing related research questions.

1.4 Scope

The article deals with the whole transport chain although the focus is stronger on the core of intermodal transport – terminal handling and rail haulage. The focus is also on the European “conventional” intermodal transport industry with haulage of goods loaded in containers, swap bodies and semi-trailers. Dedicated systems for one customer or a particular type of goods are not extensively treated.

A European overview is presented together with a more detailed description of the situation in Sweden, which has a history of deregulation since 1988 when the infrastructure and train operations were split. The ambition is to show the basic structure of the intermodal transport industry rather than extensively describe every detail. The European overview covers the full intermodal chain (door-to-door) while the Swedish one covers the core of intermodal transport (terminal-to-terminal).

In comparison with the earlier studies, ferry operators or other shipping lines are not included due to the fact that the fixed connections between the UK and France as well as between Denmark and Sweden have diminished their roles although ferries are still used.
2 The European intermodal transport industry

This section is aimed at describing the actors in the European intermodal transport system, their roles, competitive situation and connections to other actors. It is essential to know the background of the actors, ownership conditions within the industry and the goals of the actors in order to understand how the industrial system of intermodal transport has emerged and now works. Hence, the first part of the section is devoted to the background of the industry.

2.1 History and overview

The combination of traffic modes implies that many actors are involved. The European intermodal rail transport market is traditionally divided between companies based upon rail and road transport respectively. Considering regulated monopolies and the historic scope of concessions, the borderlines between market segments have been drawn according to types of unit load and geographical markets. Due to transport policy deregulation in the EU, this practice is now diminishing.

The classic role of the railway companies has been to sell rail haulage between intermodal transshipment terminals. They also operate terminals and supply rail wagons. In addition, the railway companies have owner interests in many of the other actor categories needed for producing intermodal transport services.

When the container was introduced in the shipping industry during the 1960's the national railway companies founded container transport companies in order to offer complementing land transport. Intercontainer (now Intercontainer-Interfrigo, ICF) was founded for international transport and companies like Transfracht in Germany and Compagnie Nouvelle de Cadres (CNC) in France were founded for domestic transport. ICF and the national container companies have their base in the transport of maritime containers to and from seaports, but they also offer transport of containers, swap bodies and to some extent also semi-trailers between European inland terminals.

Forwarders and hauliers formed their own national intermodal transport companies such as Kombiverkehr in Germany, Novatrans in France and HUPAC in Switzerland. The original purpose of these organisations was to organise the transport services that the road-based transport companies had concessions for. Now in the post-regulation days, they still arrange intermodal services but due to the fact that most hauliers are Small- or Medium sized Enterprises (SME:s), their role as a strong counterpart to the railways in negotiations is significant. This goal is, however, rarely stated since the national railways usually hold a minority share of the companies. The companies coordinate their international operations through the organisation UIRR\(^2\).

Many, not in the last place the European Commission, entertain hopes that new entrants will emerge on the scene and start to offer intermodal services. However, high initial costs, large economies of scale, lack of worked up market shares and the industry’s currently low profitability keep new entrants away. Also the lack of long-term

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\(^2\) Union Internationale des sociétés de transport combiné Rail-Route in French, International Union of Intermodal Operators in English.
transport policies discourages private investments. One exception has been that American companies try to practice their domestic intermodal experiences in Europe. The general trend, though, is that the already active European actors find new markets or extend their service offers. The present actors have also formed alliances, such as NDX, TARES and European Rail Shuttle\(^3\), in order to get access to critical resources or worked up shipper contacts. These initiatives all aim for picking the cherries of intermodal transport, e.g. the large-scale shuttles for transport between container ports and their hinterland. Hence, such initiatives do not primarily capture market shares from road transport but from existing intermodal services.

2.2 Shippers

The role of the shippers, in this study defined as the buyers of the system's output, in the intermodal transport system is largely determined by the size of the shipments. Shippers sending full unit loads (15-35 tons depending on type of unit load) obviously take a larger interest in the system, while customers sending general cargo generally do not know how the goods are forwarded. The trend of mergers and take-overs results in larger industrial companies serving world-wide markets that together with trends of out-sourcing and demand for one-stop-shopping implies big challenges for logistics service providers.

Apart from stuffing and stripping, activities regarded as carried out outside the intermodal transport system, the activities performed by shippers are supplying unit loads, occasionally operating transfer equipment at private sidings and, also occasionally, performing local road haulage. Accordingly, some supporting activities such as empty stacking and repair of unit loads are sometimes performed by shippers.

2.3 Forwarders

The role of the forwarders is to act as an intermediary in the transaction of transport services between transport buyers and operators supplying physical transport services. Since they consolidate the goods and thus mediate the specific demands of a multitude of shippers they can be called proxy customers.

Traditionally forwarders perform activities such as, 1) physical and administrative consolidation of small consignments; 2) warehousing, storing and processing services; 3) administration of information and documentation; 4) customs declarations and 5) supplying load units. Ties to the hauliers have traditionally been very strong for the land transport segment. Many forwarders also operate lorries themselves and are thus both forwarders and hauliers.

Forwarders have a dominant position in the transport system but their size is often overestimated since they are trading companies and they show large turnover figures.

\(^3\) NDX was a joint venture between the National Railways of the Netherlands (NS), German State Railways (DB AG) and American CSX Intermodal. NDX has seized operations, the profitable relations were taken over by Transfracht International after the withdrawal of CSX and the merger of NS Cargo and DB Cargo into Railion in 2000. TARES is a marketing alliance between HUPAC, CEMAT, the American railroad Norfolk Southern and Container Port Group (CPG). European Rail Shuttle is a cooperation between the container shipping lines P&O Nedlloyd and Maersk-Sealand.
but neither figures of value added, number of employees nor the balance sheet are equivalent to, e.g., the railway companies. This is especially true for the much hyped but still rather insignificant 4PL:s, or non-asset-based operators, such as Exel, GeoloLogistics and Celexor, which take on a co-ordinating role only and buy all physical activities.

Forwarders act on different markets defined, as relevant here, by size of consignments, geography or type of unit load. The traditional forwarders such as Schenker, Danzas and Kühne & Nagel, have closely established connections to road hauliers and use intermodal transport as a complement, as reserve capacity or when customers specifically ask for it. These large forwarders attempt to offer all types of transport to and from all geographical areas. Semi-trailer is the main unit load within Europe, even though swap bodies are increasingly used. The wide range of transport on offer implies that the traditional forwarder covers the full truck load, part load as well as general cargo markets.

Semi-trailer operators such as Nordcarrier, Teamtrans and GT Spedition usually own semi-trailers and buy the haulage services from small hauliers, short sea shipping lines or intermodal operators. They have terminals for grouping shipments, however on a smaller scale than the traditional forwarders since they primarily move part loads and full loads. Geographically, they often specialise in transport between two countries and co-operate bilaterally with a similarly focused forwarder.

The swap body operators are connected most closely to intermodal transport. Their business orientation is to transport full loads at fixed transport links. The road haul cost of swap bodies is higher than for semi-trailers, which means that swap bodies are badly suited for three leg designs of transport routes. Moreover, it is sometimes difficult to find hauliers that have lorries with swap body platforms in some countries while semi-trailer tractors are found everywhere. This segment is losing significance since some formerly specialised forwarders such as Skandi\(^4\) and Hangartner now also operate semi-trailers.

Container shipping lines and the shipping agencies have shown a particular interest in controlling also the hinterland transport. Maersk-Sealand and P&O Nedlloyd are also partners in intermodal train operators specialising in shuttles to and from the big ports. Due to significant competition fines from the EU\(^5\), they are now a little cautious.

It should be noted though, that there are vast differences in the forwarding role between national markets. In Germany, France and Sweden large traditional forwarders dominate while Dutch forwarders to a larger extent have vehicles of their own combining the forwarding and haulier roles. Italy and Spain have almost as many hauliers

\(^4\) Skandi is now part of Norfolk Line, a sister company to Maersk-Sealand in the A.P. Möller group. Norfolk Line now also includes the semi-trailer operator Euroute.

\(^5\) The line conference TACA that replaced the forbidden TAA in 1994 soon controlled some 60% of the North Atlantic container shipping capacity. The shippers claimed an over-charging of 80%, while the shipping lines admitted 20%. When shipping lines forced customers to use their transport services also for the hinterland, they violated the EU competition laws and were fined 273 million EURO in 1998. Maersk-Sealand had to pay 54, P&O Nedlloyd 42 and ACL 7 million EURO.
as lorries, hence lacking a forwarding level although the trend is to co-operate in different forms of alliances.

Besides information systems for controlling the flow of consignments, resources controlled by forwarders are mainly the general cargo terminals and the unit loads.

2.4 Hauliers

In this study the hauliers have been given a minor role. This is primarily due to the fact that forwarders choose the traffic mode together with shippers. Other researchers (e.g., NEA et al., 1992) have given the hauliers a more prominent role in the intermodal transport system, since some hauliers also take on a forwarding role at certain markets. The size of the hauliers varies widely between European countries. In Germany, Italy, Spain and Sweden the hauliers are of moderate size while the French and Dutch road transport market is dominated by somewhat larger hauliers.

In Sweden and Germany, hauliers are contracted for moving full truck loads by forwarders, container shipping agencies or terminal companies and they generally lack a market organisation directed to the shippers. In many other European countries, however, a direct shipper-haulier relationship is the norm. In domestic transport, hauliers are generally contracted for a long distance haul and decide whether to buy a terminal-to-terminal transport by rail. In international intermodal transport, hauliers have a sub-contractor role supplying the forwarder with one local road haulage. Another haulier will then be contracted for the other short haul.

The resources of the hauliers vary according to their size. Some hauliers have specialised in hauling one type of load unit while other larger companies possess vehicles for all types of transport. Other activities performed are supplying unit loads and, occasionally, to operate terminals. With horizontal transfer systems, the hauliers will become more important for the transfer activity.

2.5 Intermodal operators

Under this heading a number of similarly focused companies are clustered. Their size and scope in terms of range of activities and controlled resources vary significantly but they share a central feature: they offer terminal-to-terminal services, i.e. rail haulage and transshipment.

2.5.1 ICF

ICF, co-operatively owned by European railway companies, is subject to Belgian law, although the head office is located in Basel, Switzerland. The head office manages marketing, the procurement of services, certain sales, customer liaison and invoicing, apart from strategic management. For sales and production control purposes, ICF has representatives in each country of the network.

The deregulations process in Europe initiated a long time period characterised by uncertainty within ICF. One of the reasons was the EU regulation prohibiting the border crossing container transport monopoly held by ICF. Some of ICF’s owners have also had divergent plans for the company. As an example Transfracht, subsidiary of German State Railways (DB AG), developed towards an equivalent competitor to ICF. For a period there were plans to split ICF into five geographically separated operating
companies transferred to the involved railway companies for each route. Instead ICF was relaunched as single decentralised operator of the ICF Pan-European Network in July 1999. The strategy focuses on the operated network and ICF is intensifying its effort in prioritising profit before volume and acquiring shares in strategically important terminals (ICF webpage). The close co-operation with the owner railways will continue.

In the maritime market ICF offers express trains for containers to, from, as well as between, ports. The most important customers are shipping companies and their agents. As an alternative to single-mode road transport, ICF also offers Continental transport services, mainly swap body transport. The primary customers on this market are forwarders and, for historical reasons, some large shippers. Large customers can get own full train arrangements. The segments are comparable in size, but the maritime traffic is increasing at the expense of continental traffic. The negative trend in continental traffic is by ICF blamed upon poor quality delivered from the traction providers (mainly its owners). Trying to improve the quality delivered, ICF signed a quality agreement with SNCF (X-rail, 2001/d).

As an independent intermodal operator, ICF offers the most extensive intermodal network within Europe. With a centre in Central Europe, the network contains more than 7 600 connections between around 1 600 terminals. The network is operated by shuttle trains, block trains, feeder trains and distribution trains. For connections without volumes for daily direct routes, ICF operates a hub and spoke system for block trains, Quality net, where the marshalling yard in Metz-Salon forms the centre point for 60 trains between 41 terminals in 11 countries. For larger flows, ICF avoids the roundabout to Metz by connecting block trains and shuttles directly in gateways. In addition the company avoids time delays, cost increases and risk for damages in the marshalling operations. For the operations to and from Scandinavia, ICF uses Copenhagen as a gateway. From this gateway there are distribution/feeder trains to other terminals, for example Aalborg, Esbjerg and Taulov, to increase the market coverage. Finally, ICF is also developing the Trans-Siberian Landbridge, via Brest/Malaszewicz and Vladivostok. Thereby transit time to Japan and Korea is reduced related to traditional shipping. Recent trials show a transit time of 22 days from Central Europe to Japan compared to some 30 days by truck and ship.

In year 2000 the company employed 287 persons and the annual turn over is about EURO 330 million. In 2000, 0.96 million TEU's (-10.5% in relation to 1999) equalling 1.084 billion ton-kilometres (-9.9%) were transported by ICF (Annual report of ICF, 2000). This gives an average haulage distance of 1127 kilometres. ICF has its own wagons but it also rents from the participating railway companies. ICF owns 5 300 wagons in 2002 with a total loading capacity of 17 000 TEU (ICF webpage).

2.5.2 The UIRR
Like ICF, the UIRR is restructuring, mainly through mergers and acquisitions within the group and by the inclusion of members from Eastern Europe. As a consequence of the deregulation of the transport market, UIRR has changed its statutes and can now represent all independent intermodal operators in matters like technological harmonisation, development of telecommunications and transport policy issues, also those with national railways as majority shareholders. So far, these companies are welcome as associated members and CNC got this status in 1998 (UIRR webpage). Rocombi
and Bayrischer Trailerzuggesellschaft joined UIRR as active members during 1999. Today UIRR has 19 active members and one associated member distributed over 18 countries.

Table 1 The national UIRR-members

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<tr>
<td>Austria</td>
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<td>Denmark</td>
<td>Kombi-Dan</td>
<td>Slovenia</td>
<td>Adria Kombi</td>
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<tr>
<td>France</td>
<td>Novatrans and CNC</td>
<td>Spain</td>
<td>Combiweria</td>
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<tr>
<td>Germany</td>
<td>Kombiverkehr and BTZ</td>
<td>Sweden</td>
<td>Swe-Kombi</td>
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<td>Great-Britain</td>
<td>CTL</td>
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<td>The Netherlands</td>
<td>Trailstar</td>
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The geographical business areas do not exactly follow national borders. This is due to historical reasons since the UIRR has expanded with joint ventures between existent national countries entering new national markets. This has been the origin of Cemat in Italy, founded by Hupac and Kombiverkehr; and Swe-Kombi in Sweden, founded by Dan-Kombi and Kombiverkehr.

The most important objectives for the UIRR, as a co-operation association are to facilitate co-operation, represent the political interests of the intermodal transport companies and to create positive publicity. All activities that "end up with an invoice" are subjects of the member companies. The UIRR is financed by contributions from the member companies. Prices and arrangements are decided by bilateral agreements between the national UIRR-companies and the railway companies involved. Hence, the national UIRR-companies act as wholesalers of intermodal transport to forwarders and hauliers. Traffic structure diverges between different UIRR companies, e.g.:

- During 2000 Kombiverkehr introduced a network traffic system, the KombiNetz 2000+ to offer freight forwarders and hauliers high quality service, between 60 terminals produced by 26 trains. The aim is to provide fast overnight service in Germany and increasing the quality in gateway service through linking the German national and the international networks, effective quality management through close co-operation with DB AG (now owning half of Kombiverkehr) and DB Netz and finally provide good connections to the ferries to Scandinavia (Annual report, DB AG, 2000 and Kombiverkehr, webpage).

- Swe-Kombi has focused on the development of a number of transport corridors. This provides greater possibilities of offering high quality transport services.

- Ökombi, HUPAC and RAlpin (partly owned by HUPAC) offer Rollende Landstrasse (Rolling Highway) through the Alps. In the Lôtscberg-Simplon Route operated by Ralpin a 4 metres corner height limit now allows high-cube vehicles to be transited (X-Rail, 2001/a).

Some UIRR-companies, e.g., Trailstar, Novatrans and Hupac, operate terminals, most own rail wagons while others, e.g., Swe-Kombi, act as down-right intermediaries. Hence, terminal equipment and rail wagons are resources of some UIRR companies, but generally the only assets are the administrative systems controlling the operations.
Based on volumes, the UIRR-family is the largest intermodal operator in Europe. The transport work rose with 8.2% in 2000, resulting in a national and international flow of 31 billion tonkms, of which 74% is international traffic. The flows within and across the borders of Austria, Germany, France and Italy embrace around 95% of the total transport work. Average distance is 700 kms for international flows and 600 for domestic flows. The international average distance has decreased since 1990, due to increasing share of short range Rolling Highway. Swap bodies and containers attained 68% of the consignments, semi-trailers only 9% and the Rolling Highway 23%. The long term tendency clearly shows a decreasing number of semi trailers, -27% since 1991, but increasing shares of swap bodies (+74%) and rolling highway (+103%) (UIRR webpage).

2.5.3 National Container Companies

Domestic container transport by rail was normally arranged within subsidiaries of the railway companies, but as mentioned, this category of intermodal operators now also handle international flows. The main focus, however, is still on domestic transport to, from and between ports as a part of an intercontinental transport chain or a door to door transport using own unit loads, generally Euro-pallet adapted swap bodies and inland containers. Compared to the UIRR the commitment of the national container companies is more extensive, i.e. the UIRR companies do not compete with their owner hauliers and forwarders through offering unit loads and road haulage.

Examples of national container companies are Transfracht in Germany, CNC in France, Freightliner Ltd in the UK, Italcontainer in Italy and Interferry Boats in Belgium. The Scandinavian national container company Cargo Net A/S, a merger between NSB Freight in Norway and Rail Combi in Sweden, is described in chapter 3. The national container companies are usually subsidiaries of the railway authorities, but Freightliner, for instance, has been privatised and CNC is owned by SNCF (71%), Interferry Boats (10%), Novatrans (5%), Danzas (4%) and others (10%). CNC in turn owns 5% of Novatrans (CNC webpage). Within short, however, SNCF, SNCB and Trenitalia will form the joint venture Ifrabel, coordinating the activities of CNC, Interferry Boats and Italcontainer (World Cargo News, 2002/a).

The main business for DB AG’s subsidiary Transfracht, is supplying intermodal transport between European business areas or continental cross-border transports. The company was founded in 1966 and the turnover has now reached DEM 500 million and the transport volume was around 685 000 TEU's in 2000 (Transfracht webpage).

Transfracht is directed from the main agency in Frankfurt am Main, marketed and offered by agencies in Antwerp, Rotterdam, Berlin, Duisburg, Hamburg and Moscow. The offer covers door-to-door transport and is split into overseas traffic and inland container transport and overseas traffic, of which the latter is dominating. For inland transport, the primary focus is developing European-wide block trains and shuttle connections between the ports in Belgium, the Netherlands, Germany and Italy to business areas in France, Austria, Switzerland and CIS. For the relations from German ports, mainly Bremerhaven and Hamburg, the Albatross Express, a 12 hour overnight express service within a radius of 900 kms, is offered. Except from the major cities in Germany, this service also includes connections to Northern Switzerland, Austria and France. The continental traffic is offered as dedicated trains between industrial regions, for example the Ostwind between Moscow and Berlin with block train connection to the major ports.
Terminals are operated by other companies owned by DB AG directly or via Transfracht. The wagon fleet is operated in the DB AG subsidiary Kombiwaggon. For the inland container services, Transfracht operates a container fleet.

Since 1948 CNC organises grouped shipments and was one of the first companies to containerise the railway traffic. Containerisation was a suitable solution for transporting equipment and provisions for the Far East. In 1998 CNC became associate member of the UIRR, but is still classified as national container company. CNC has grown to one of Europe’s largest container operators and during 2001 the company’s turnover reached EURO 230 million.

During 2001, CNC transported 651,000 TEU for around 1500 European customers, shippers and maritime operators. Like Transfracht, CNC offers both continental (Continental European Service) and maritime services (Naviland European Service), where the first mentioned answers to 58% of the turnover and the latter to 38%. Services such as stacking, repair and maintenance of unit loads as well as document handling and local road haulage are offered at the terminals, which answer to the last 4% (CNC webpage). CNC suffers from lost traffic due to strikes, saturation of main routes and shortage of rail engine drivers and will cut 10% of the staff in 2002 and will, as mentioned, merge with Interferry Boats and Italcontainer into Ifrabel (World Cargo News, 2002/a).

CNC operates 30 terminals in France and offers connections to around 70 more in Europe. The network offered to customers is split into three sub-categories; (1) Combi Express, i.e. a service within France, operated on a daily basis, reaching major industrial areas within 12 hours, (2) Combi 24, i.e. a service offering connections to all terminals in France within 24 hours and finally (3) Combi Europe providing service in co-operation with equal intermodal operators to European markets outside France within 24 hours through a gateway connection to other networks.

For the operations CNC owns 4,500 wagons, a decrease with around 1000 wagons since 1999 and 5000 swap bodies for continental service (CNC webpage). Together with 250 connected road hauliers the company operates 1,400 road vehicle chassis.

Freightliner Ltd in the UK has a history in British Rail but was privatised in 1996. Today it is owned by the management, employees and the financial institutions 3i and Electra. Freightliner operates more than 100 daily trains between seven ports and eight inland terminals with over 100 own diesel and electric locomotives, 1750 wagons, 180 road tractor units and 500 road trailers.

2.5.4 New entrants

The intermodal road-rail transport sector in Europe is undergoing large structural changes, due to EU’s and its member states’ strive towards modal split, competition and efficiency. A large number of new actors or entrants have emerged, of which some have already disappeared. New entrants have in common that they have tried to compete for market shares already belonging to intermodal transport, mainly the large flows of ISO-containers to and from the ports. Four major categories among the new entrants are distinguishable.

The first category is the container shipping lines’ and their agencies’ ambition to control the continental transport from the ports to their hinterland since they cannot get
significantly larger market shares at sea. The hinterland market for container transports opened up after the mentioned EU verdict on competition fines in 1998. This resulted in caution regarding the shipping agents’ ambition to control the choice of land transport mode, which opens up for new actors to enter the market.

The European Rail Shuttle (ERS) started as a co-operation between the container shipping companies P&O Nedlloyd, Maersk-Sealand with Railion Benelux as train operator. Using Rotterdam as centre point, the network consists of intermodal shuttles to the central, southern and eastern parts of Europe, totally amounting 20 shuttles. As an example the shuttle between Rotterdam and Melzo/Milan has a capacity of 180 000 TEU per year. These volumes have been built up through competition with the ICF and through the strategy to decrease the number of container ships with direct calls to Italian ports from Asia (European Rail Shuttle, webpage). The ERS has developed the new concept boXXpress together with KEP Logistics and Eisenbahn und Verkehrsbetriebe Elbe-Weser (EVB) (Svensk spårtrafik, 2000). EVB acts as intermodal operator and the engines are leased from Siemens Dispolok and the wagons from Ahaus Alstatter Eisenbahn. The traffic started in June 2000 and offers daily connections between Hamburg and Bremerhaven to München, Nürnberg and Stuttgart and the capacity is around 135 000 TEU per year.

The second category of new entrants relates to the port authorities partly because they attempt to attract larger flows to the port and partly because each port try to solve the increasing practical and environmental problems arising with even more lorries in the close vicinity of the port. In Germany the port authorities, especially Eurogate, the merge between BLG in Bremerhaven and Eurokai in Hamburg, and HHLA have put forward the idea of using intermodal trains. In France the terminal company in Le Havre has argued to keep and improve the intermodal service to and from the port. These connections, like the whole rail sector in France, suffer from the frequent strikes and lack of engine drivers.

HHLA, owned by the Hanseatic City of Hamburg, was, as mentioned above, active in the process to start new intermodal shuttles and today the company are shareholders in the companies Polzug, Metrans, Hansa Hungarian Container Express (HHCE) and CombiSped. Polzug was founded in 1991, and is apart from HHLA (40%) owned by the rail companies DB Cargo (20%) and PKP (40%) and operates container shuttles between polish cities, for example Warsaw, Katowice, Lodz, Wroclaw and Gdansk, and the ports in Bremerhaven and Hamburg. In Poland there are connections to terminals in Russia, Ukraine, Belarus and the Baltic countries. The transports have increased from 4 800 TEU in 1992 to around 50 000 TEU in 2001 (Polzug webpage).

Metrans is the largest intermodal operator in the Czech Republic, including an agency in Hamburg and controlled inland terminals in the Czech Republic and the company is shareholder of terminals in Slovakia. The network is operated with daily shuttles and the company also offers services related to container transport and handling. The third company connected to HHLA is HHCE that connects Bremerhaven and Hamburg with the gateway Sopron in Hungary. 95-99% of all containers carried by rail and bound for Hungary pass Sopron (Transportjournalen, 1997). From Sopron there are block train routes to 14 terminals and 130 stations around Hungary. Finally, CombiSped is a local transport service Hamburg – Lübeck. HHLA is majority shareholder, but the traffic is so far operated by road haulage.
In France the Le Havre Shuttle Service, a joint venture including the Port Authority organises and markets container shuttles, operated by CNC, from the port to Lyon and Strasbourg for continental and maritime goods. The success is heavily influenced by SNCF, either through allowing access to the network or through the lack of staff and engines affecting the transport quality.

Deregulation, the former national railway authorities’ production and image problems together with shippers’ wish to use rail, opened a new market for a few independent railway and intermodal operators, making up the third category. Rail4Chem in Germany, for example, that together with Hoyer GmbH operates trains including both conventional rail wagons and such carrying unit loads for another shareholder, Bayer AG (X-rail, 2001/e and X-rail 2002/a). In Sweden IKEA recently launched IKEA Rail, an intermediary between the parent company and the train operator, striving towards increasing IKEA’s use of rail from 18% to 40% in line with its environmental policy. Generally the companies aim at high quality in the long distance goods flow by use of the same staff and rolling stock through the entire transport chain.

Finally some pure traffic operators appeared in a narrow niche aiming at operating shuttles between ports and their hinterland or on behalf of large shippers, i.e. comparable to traditional road hauliers or short lines in the US. These companies are normally small with simple administration, but the tendency, towards strategic alliances and mergers to avoid vulnerability, is clear. One example is Hafen und Güterverkehr Köln AG (HGK) that operates the Central European network since 1998. At present three container shuttles are operated daily, either alone in Germany or in alliances in the border crossing routes, for example with SBB on the route Basel-Köln.

Earlier mentioned EVB also supplies traction for the NeCoSS (Neutral Container Shuttle System), a joint venture between Connex Cargo Logistics GmbH, a subsidiary to Vivendi Environmental (which in turn is a partly owned subsidiary of the conglomerate Vivendi Universal), and shipping agent Acos Transport GmbH. Five times a week NeCoSS connects Bremen, Bremerhaven and Hamburg with the inland terminals Schweinfurt, Germersheim and Stuttgart-Kornwestheim. The train also includes conventional rail wagons (World Cargo News, 2002/b and Connex, webpage).

Connex Cargo Logistics also owns the regional railways Farge-Vegesacker Eisenbahn-Gesellschaft mbH (Bremen), Hörseltalbahn GmbH (Eisenach), Regiobahn Bitterfeld GmbH, Teutoburger Wald-Eisenbahn-AG (Gütersloh), Bayerische CargoBahn GmbH, NordwestCargo GmbH, Rail Cargo Berlin GmbH and a majority share of Industriebahn-Gesellschaft Berlin mbH (Connex, webpage), although these are mostly active in the wagon load segment.

Starting out from a forwarder role, Hangartner has with a significant Swiss subsidy (2,2 out of 3,7 million CHF) invested in a terminal in Domodossola and operates traffic between that terminal and Basel Weil. The intention is that 400 daily lorries should be shifted from road to rail in the end of this year (Swiss Customs, 2001). Finally, Kühne & Nagels subsidiary Ferroviasped operates trains to and from Port of Antwerp.

2.6 Terminal companies

It is not obvious whether the terminals as interface between rail and road and between operations and infrastructure should be an asset of the rail operators, the infrastructure
managers or dedicated terminal companies. Since this analysis takes a company perspective, this section focuses dedicated terminal companies.

Terminals are traditionally a railway asset, but in Germany, for instance, DB Netz and DB Cargo have own terminals as well as shares of dedicated terminal companies. Some of DB’s ownership interests are presented below.

**Table 2 DB’s owner interests in terminal companies in Germany.**
(Source: Berufsakademie Mannheim, webpage).

<table>
<thead>
<tr>
<th>Company name</th>
<th>Terminals at</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deutschen Umslaggesellschaft Schiene-Strasse mbH (DUSS) (DB Netz 50%)</td>
<td>Bodenheim, Berlin, Mannheim and Stuttgart</td>
</tr>
<tr>
<td>Roland Umschlagges. für den komb. Güterverkehr mbH &amp; Co KG (DB Cargo 14,66%)</td>
<td>Bremen</td>
</tr>
<tr>
<td>Container-Depot München GmbH &amp; Co Service KG (DB Cargo 11,8%)</td>
<td>München</td>
</tr>
<tr>
<td>DeCeTe Duisburger Container-Terminalgesellschaft mbH (barge-rail-road) (DB Cargo 25,01%)</td>
<td>Duisburg</td>
</tr>
<tr>
<td>CTS Container Terminal GmbH Köln (DB Cargo 22,5%)</td>
<td>Köln</td>
</tr>
<tr>
<td>Container Terminal Dortmund GmbH (DB Cargo 30%)</td>
<td>Dortmund</td>
</tr>
<tr>
<td>PKV Planungsges. Kombinierter Verkehr Duisburg mbH (DB C. 50%)</td>
<td>Duisburg</td>
</tr>
<tr>
<td>Terminal Singen TSG GmbH (DB Cargo 50%)</td>
<td>Singen</td>
</tr>
<tr>
<td>Umschlagbahnhof München-Riem (UBM) (DB Cargo 51%)</td>
<td>München</td>
</tr>
<tr>
<td>Buss-Trans Container Service GmbH (BTS) (DB Cargo 51%)</td>
<td>Frankfurt, Ludwigsburg, Nürnberg</td>
</tr>
<tr>
<td>Dörpener Umschlagsges. für den komb. Verkehr mbH (DB Cargo 35%)</td>
<td>Dörpen an der Ems</td>
</tr>
</tbody>
</table>

Multimodal terminals combining road, rail and sea transport shows a little other pattern depending on the dominant mode, mainly sea. Open for the combination of road and rail, the US-based company CSX World Terminals (CSXWT) operates the inland port in Germersheim in Germany that also offers transshipment services for rail connection to Rotterdam, Hamburg, Bremen and Bremerhaven (World Cargo News, 2002/b and CSXWT, webpage). Examples of private terminal operators are the forwarders Translog that operates the road-rail terminal in Schweinfurt (Translog, webpage) and Hangartner that operates a terminal in Domodossola (see above).

In Sweden, Rail Combi is the principal of all terminals but some are operated by hauliers on tender for Rail Combi and yet others like Älmhult are co-owned with local communities and shippers. The new Luleå terminal that is under construction will be owned by the community but leased and operated by a terminal company owned by Rail Combi and local hauliers. Port authorities also operate terminals, but only occasionally they serve the combination road and rail as Port of Göteborg. There has been a debate whether the infrastructure manager Banverket should take the responsibility for the terminals, but since Rail Combi was merged with NSB Cargo into Cargo Net, this would now be much more difficult.

Freight villages (FV:s) as consolidation points for freight transport often include a road/rail terminal. FV:s are formally established in some countries, but most larger cities have a dedicated area for logistics activities that fulfils the definition of a FV. The development was initiated by German communities in the early 1980’s, and today 59 European FV:s are organised in Europlatforms (Europlatforms, webpage).
2.7 Rail operators

The role of the railway companies is very complex. They have contributed to establishing forwarders and hauliers as well as intermodal operators and terminal companies. In recent years, they have increased their ownership in intermodal operators, but the trends differ between different regions in Europe.

During the 1990s the trend was to separate the responsibility for train operations and infrastructure and to turn the railway companies into companies. The Swedish rail system was divided between SJ, responsible for train operations and Banverket, responsible for infrastructure in 1988. From 2001, the traffic operating part of SJ was split into a freight company, Green Cargo AB, and a passenger company, SJ AB. As described in chapter 3, competition has been established on all Swedish tracks and like in Germany several new rail companies have appeared since 1995.

In southern Europe, also partly in Germany, there are still strong relationships between the rail operator and the infrastructure company, limiting the possibilities for new entrants to enter the market. Although divided as organisations, the former railway authorities have a strong effect on the infrastructure planning and slot allocation as large users and with grandfather’s right to slots.

Intermodal transport wagons either run in full trains/shuttles, block trains or in the conventional wagonload system. The railway companies have a greater role in planning and scheduling in the latter case when the intermodal transport wagons are part of normal wagonload trains. The engines must be switched at almost every border within Europe due to technical and legal compatibility problems. This causes a large control problem if high utilisation with return haulage is prioritised. But there is a clear trend towards strategic alliances and mergers between companies in Europe trying to extend their network, and the use of multiple-current locomotives diminishing the border-crossing problems.

The US trend of merging railway companies into successively larger companies is present also in Europe. Railion AG is a merger between DB Cargo (92%), NS Cargo (6%) and DSB Cargo (2%). This particular growth strategy has recently been abandoned, firstly due to changes in the strategy and organisation of, for example, SBB and SNCF, secondly due to the difficulties in controlling large companies, and thirdly due to that the railways have to give up some degrees of freedom when merging and finally that all governments are not ready for major changes within the railway sector. Despite this, the freight divisions within SBB and FS continue to integrate their freight organisations under one organisation, however in a gentle pace.

2.8 Equipment leasing companies

The increasing number of actors, due to the deregulation, on the European intermodal market, results in a wish to decrease the number of empty positioning of unit loads and rail wagons may be reduced by concentrating ownership to a number of large companies. It must be emphasised that the transport system, according to the principle of unit loads, is optimised towards high capacity utilisation of the rolling material and not of the unit loads. Once loaded with goods, however, they are tightly managed.

The main objective of equipment leasing companies is naturally to offer better utilisation of equipment but also to relief the balance sheets of their customers. The railway
companies have traditionally had a poor resource utilisation with wagons standing at private sidings far from the main tracks. The leasing companies are considered as more suited for efficient control of equipment due to their commitment to this matter only and their more limited size. Nevertheless, the wagons and engines are easier to control in intermodal transport as they preferably go in full trains between terminals, but for new intermodal entrants the investment in new engines, especially multi-current engines, might be deterrent.

Containers are traditionally owned by shipping companies or their agents, and they are often administrated in jointly operated pools. The aim of the pools is the same as for leasing companies: to reduce empty positioning and increase utilisation. Specialised leasing companies are also large owners of containers. Hauliers and forwarders so far dominate ownership of semi-trailers. Semi-trailers for intermodal transport need some special modifications; lift pockets at the sides, more robust constructions and adaptation to road traffic regulations and tunnel profiles of the trafficked countries. A number of companies have specialised in semi-trailer leasing so that the forwarders do not need a large array of semi-trailer types.

The leasing companies’ superior ability to control equipment on a large geographical market means that their role is greater concerning international than domestic connections. At domestic markets, the hauliers control both pre- and end-haul and generally also supply the semi-trailer, while the forwarder contract different hauliers on international markets and then often also lease or rent the semi-trailer.

The owners of intermodal transport wagons are railway companies, ICF, the UIRR-companies, national container companies and some of the new entrants. Only a limited number are owned by wagon leasing companies such as the TransWaggon and Nordwaggon. Nevertheless, in Germany, DB operates their intermodal wagons in the subsidiary Kombiwaggon GmbH.

In order to increase the utilisation of the engines and to improve maintenance services, the large rail operators change strategy from pure operators towards offering both operative and leasing activities. Austrian State Railways (ÖBB) intends to change the core strategy from being a traditional rail operator to be the largest engine leasing company for both the US and European markets. The number of engines in ÖBB amounts to 1 800 and this company can even serve its customers with between 4000 to 6000 wagons. Recently ÖBB established the joint venture Loc-Pool with DB AG to increase the resource utilisation in the traffic between the countries (X-rail, 2001/b). In Sweden, a subsidiary to Green Cargo, TGOJ Traffic, offers engines and staff as operator or as leasing company, TGOJ Rental (TGOJ trafik, webpage and Ånghwisslan, 1999).
3   The Swedish intermodal operators

In this chapter a case study of the present intermodal operators in Sweden is presented. Since the 1980s, three major changes have occurred. First, the infrastructure authority was separated from the operative part of the former State Railway in 1988. Second, the Swedish Parliament voted for establishing competition on all Swedish tracks in 1995. And finally on January 1st 2001 Green Cargo, the former Freight transport division within SJ became a limited company. These changes and the Swedish parliament’s strive to an efficient and effective rail sector created large surplus of engines and to some extent engine drivers and thereby opportunities for new entrants to launch operation on the Swedish network.

3.1   Green Cargo

Today, Green Cargo has 3 900 employees including the subsidiaries, the turnover in 2001 was 6.3 billion SEK (app. 700 million EURO) and the transport work carried out amounted to 17 billion tonkms (Green Cargo homepage). A current problem with the wagonload traffic is that the last distance at private tracks are very costly and can thereby not be performed with profit. New services have to be developed in order not to loose this part of the market and also going further down regarding shipment sizes.

3.1.1   Light-combi

In order to target the transport market of full container loads and part loads over distances in the range of 200-500 kms, Green Cargo developed Light-combi. The concept is based upon fixed-formation train sets that make short stops – 15-30 minutes – at sidet track terminals approximately every 100 kilometres. At the terminals, swap bodies are transhipped under the overhead contact line by use of a forklift truck carried by the train and operated by the rail engine driver. The offered service includes local road haulage.

The service offered by the Light-combi pilot, The Dalecarlian Girl, included, except from the transport, handling and distribution of temperature sensitive goods from the wholesaler Dagab in Borlänge to 37 Hemköp stores. These stores are situated in the southern and middle parts of Sweden. The system was initially intended to include transport of colonial products and chilled goods requiring controlled temperatures.

The Light-combi technique used in the customer pilot, was rather simple and inexpensive and worked technically well. The performance of the customer pilot was high and the customer has been satisfied with this as well as the producer. The customer pilot was closed down, in April 2001, due to the difficulty in pricing and to achieve economy in the system without the large investments required adding more customers (Woxenius et al., 2001).

3.1.2   Green Cargo Recycling and Green Cargo Distribution

Green Cargo Distribution is a service for markets “one consignor and several consignees”, where lorry distribution is a part of the offer. The size of the shipment is generally smaller than for conventional wagonloads and is based upon unit loads. Conventional intermodal techniques are used, e.g., intermodal terminals operated by Rail Combi, but priority is given to unloading operations using a forklift truck at sid-
ings. If the flows will increase the future choice will be using turntable wagons as transhipment technique. The strategy is to build up customer and flows before production system (Nilsson, interview, 2000).

Green Cargo Recycling was launched in 2000 and is a service system for return flows to supply the demand for reverse logistics. Green Cargo has used this concept for some years to transport garbage from Lysekil to Göteborg with a turntable technique.

### 3.1.3 Green Cargo Intermodal Shuttles

In close co-operation with large shippers Green Cargo develops, operates and markets shuttle trains. Recently the shuttles Göteborg-Insjön and Gävle-Insjön were launched. Each shuttle runs three times a week and most cargo, 10 000 TEU’s per year, is bound for Japan. The new container terminal in Insjön and the shuttles are results of close co-operation between the regional authorities, Green Cargo and the customers Bergkvist-Insjön AB and Tomoku Hus AB. Green Cargo, who has equipped the terminal with a reach stacker and a semi-trailer tractor, leases the terminal. Earlier 70% of the 5000 containers were transported to the ports by road.

### 3.1.4 TGOJ Trafik

As mentioned, the Green Cargo subsidiary TGOJ Traffic, offers engines and staff, either as operators or as leasing company (TGOJ Rental). The core business is to operate local or regional rail traffic, with aim at system trains and local rail haulage. Secondary service includes leasing engine drivers (20 engine drivers) and a larger number of diesel and electrical engines (Ångwisslan, 2000 and TGOJ homepage). Recently, the company leased a diesel engine, GM class 66, and drivers to IKEA Rail, when their transports of furniture between Duisburg and Älmhult starts on May 22nd 2002. TGOJ also operates the intermodal shuttle Gävle-Södertälje-Göteborg for ICS as described above. For the intermodal shuttle Vännerexpressen, BK Tåg is leasing an electric engine class Ma.

### 3.2 Rail Combi/Cargo Net A/S

The Business unit for intermodal transport of SJ, SJ Kombi, became a limited company on July 1st, 1992. Rail Combi has 175 employees, the turnover in 2000 was 456 million SEK (app. 50 million Euro) and the total volume was about 2,49 million tons. During 2000 approximately 442 000 TEU or 233 000 consignments were handled by Rail Combi.

From Jan 1st, 2002, Rail Combi is an independent subsidiary within Cargo Net A/S. The aim is to improve customer service with the combined network of 16 terminals in Sweden and 12 in Norway. This new constellation, owned by NSB (55%) and Green Cargo (45%), includes both wagonloads and intermodal services in Norway and intermodal service in Sweden and will get a turnover of approximately 2 billion NOK (250 million EURO).

Rail Combi develops and produces domestic and international intermodal transport to hauliers, forwarding agents, shipping lines and railway operators. Local road haulage is also offered on specific demand, however in co-operation with hauliers. Document handling, mainly print-outs of different consignment notes, is a small but steadily increasing part of the operation. The company supplies terminal services, certain depot
services as well as rail haulage. Examples of depot services are ocular inspection and
repair, warehousing and cleaning of unit loads.

It is difficult to put a label on Rail Combi as it sells a wide variety of services related
to intermodal transport. Rail Combi is principal for all Swedish terminals and it is an
intermediary part for rail haulage services. On the domestic market, Rail Combi sells
directly to forwarders and hauliers, while ICF and the UIRR are intermediary parts in
the border-crossing market.

International service is provided in close co-operation with Cargo Net, HUPAC and
Kombiverkehr since last year (X-rail, 2001/c). The purpose is close co-operation in
developing, marketing, producing and offering intermodal network shuttles through a
gateway concept between the different national networks of Germany, Italy, Norway,
Sweden and Switzerland. This service is provided through the SRE, Scandinavian
Rail Express Shuttle Service via gateways in Trelleborg and Malmö.

Another successful intermodal service is the ARE-train, the Artic Rail Express, de-
developed as a joint venture between Green Cargo and NSB Gods in 1993. The profit-
able service, with an average speed of 73 km/h through Sweden, made the missing rail
link Bodö-Narvik unnecessary.

The terminal land, except from the Skandiahamnen terminal in Göteborg, is leased
from Jernhusen AB, former SJ Real Estate Division.

### 3.3 Swe-kombi

Swe-Kombi was preceded by S-Combi, which had to suspend their operations since
the road-based companies were against the large owner-influence of SJ. After S-
Combi was shut down, Kombiverkehr and Kombi-Dan arranged intermodal transport
to and from Sweden with a branch office. This provided the opportunity to start a new
UIRR-company in Sweden, but via a new, road-oriented constellation of owners.
Swe-Kombi was funded in 1990 and is since 1999 owned by the UIRR companies
HUPAC and Kombiverkehr, 30% each, Swe-Kombi Economic Association, 30% and
Green Cargo, 10%.

Swe-Kombi may be seen as a negotiating and procurement organisation between
railway operators. Swe-Kombi buys terminal services and act as straightforward in-
termediary forwarders. In a domestic perspective the company offers service between
14 terminals, i.e. Borlänge, Gävle, Göteborg, Helsingborg, Jönköping, Luleå, Malmö,
Norrköping, Sundsvall, Trelleborg, Umeå, Årsta (Stockholm), Ålmhult and Örebro.
International routes are produced in co-operation with the other UIRR-members. Ma-
jor markets are Germany and Italy, but service is also provided to Denmark, Norway,
Belgium, France and Austria. Finally the company acts as retailer for Rolling High-
way services through the Alps.

The international flows increased during 2000 and problems arose for Rail Combi to
supply enough wagons (Lundgren, 2000). During 2000 the international flow was 7
500 consignments and the domestic embraced 3 600 (UIRR Annual report 2000).
Swe-kombi has always been a negligible part in the domestic market.
3.4 Intercontainer (Scandinavia) AB

Intercontainer (Scandinavia) AB (ICS) was established in 1993 to provide local support service for the Scandinavian intermodal market, organise agency services for ICF and attract new Pan-European business to ICF. The company is now a 100% subsidiary of ICF and provides sales and marketing of ICF’s intermodal transport services to and from as well as within the Scandinavian countries (ICF webpage and X-rail, 2002/c). The headquarter is situated in Göteborg, a branch in Copenhagen and for sales and marketing in southern Sweden a local agency recently was launched in Trelleborg. The turnover in 2000 was 6.6 million SEK (X-Rail News, 2002/c).

ICS has launched the intermodal shuttle Gävle-Södertälje-Göteborg, operated by TGOJ Trafik. Since January 2002 ICS also operates the Scandinavian Maritime Service, three times a week between Hamburg/Bremerhaven and Copenhagen/Aarhus, as a feeder transport (X-Rail, 2001/f).

3.5 The Gothia Rail Shuttle

The Gothia Rail Shuttle project was established in 1996, since the EU PACT programme awarded subsidies. The operative activities were launched in June 1998 with one weekly train shuttle in each direction between the Rail Combi terminal in Norrköping and Almelo in the Netherlands. The shuttle service was extended to Stockholm-Årsta and Södertälje in Sweden and to the Delta terminal in Rotterdam and to two weekly trains in the autumn of 1999. The service was closed in 2000.

The business idea was to develop, market and operate the international transport system, door-to-door, and to provide services to the transport industry, i.e. freight forwarders and shipping agents. On average, each train consisted of 11-13 container wagons and 13-16 pocket wagons for semi trailers.

3.6 BK TÅG

BK Tåg, a subsidiary to the Swedish BK-group, established as railway freight operator in 1998 and is at present the largest competitor to Green Cargo and Rail Combi/Cargo Net. BK Tåg’s freight division includes both intermodal transport and wagonloads, for example paper transports for MoDo between Silverdalen and Öskarshamn, transports of LPG from Sundsvall to Borlänge and copper ore from Gällivare to Rönnskär for Boliden AB (BK Tåg, webpage). BK Tåg established as intermodal operator in March 1998 when an intermodal shuttle for containers was launched between Göteborg and Karlstad in co-operation with the local haulier, LBC Värmland and the port authority in Karlstad, Vänerhamnarna. The marketing arguments were to relieve the main road between Göteborg and Karlstad and there were not enough volumes for the port authority to transport the goods by boat through the river Göta Älv (Tåg 1998, BK Tåg webpage and Ånghwisslan, 1998).

The transport frequency has, due to increasing amount of goods, changed from three weekly trains (in each direction) to five. Since January 2000 the train stops in Åmål for coupling or uncoupling of wagons if necessary. Two major customers are Tetra Pak and the coffee mill Löfbergs Lila. The port authority Vänerhamnarna acts as an intermediary between the customers and the traffic operator, BK Tåg.
In June 1999, BK Tåg took over the transport of Absolut Vodka in containers between the ports in Ähus and Göteborg amounting to 10-15 containers each week in transit from Sweden across the Atlantic.

### 3.7 IKEA RAIL

The global furnishing store chain IKEA founded its own railway company aiming to transfer large volumes of goods from road to rail. This is a consequence of the environmental policy within IKEA, based upon business considerations as well as the founder/owner Ingvar Kamprad’s profound ethical and environmental concern. As mentioned, the objective is to increase the share of rail from 18% to 40% in Europe.

IKEA Rail has signed an agreement with the railway operator Rail Transport Team (RTT)\(^6\), for rail traffic between Germany and Sweden. In a further perspective the initiative aims at launching an IKEA Rail Capacity Network in Europe that connects the centre point in Duisburg to the markets in Poland, Sweden, Italy and the Benelux countries. In order to achieve economies of scale in terms of fully utilised trains and balanced flows, IKEA is in the long run open for selling free capacity to other shippers (Beijbom, conference presentation, 2002). In the first step, launched on May 22\(^{nd}\) 2002, 50 long distance lorries will be exchanged for rail transport.

IKEA has signed an agreement with the three rail infrastructure authorities Banverket (SE), Banestyrelsen (DK) and DB Netz (DE) to secure fast (65 km/h) and stable time schedule using the North-South Rail Freight Freeways. The fact that IKEA Rail itself controls the train slots distinguishes it from other large shippers’ purchasing or logistics departments, like Volvo Logistics, that merely buy full train services. IKEA now invests considerable sums in their network of stores and logistics facilities and expects a steep rise in internal flows (Roos, 2002). Combined with expected congestion on European roads and tracks, IKEA considers the train slots as a vital asset for their future business (Kamprad, 2001).

### 4 Analysis and conclusions

Much of the analysis and presentation of trends is interspersed in the texts of the two preceding chapters and the conclusions are thus kept rather short. For the presentation, it was regarded as more reader-friendly to start with the general (Europe) and then continue with the particular (Sweden). In the conclusions, however, starting with the analysis of the Swedish case study and then compare the findings to those related to the European situation was more fruitful.

The conclusions are focused on the core of intermodal transport: terminal-to-terminal transport including the resources that distinguishes intermodal transport from single-mode transport.

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\(^6\) The operator RTT is a consortium existing of three local train operators; Ruhrkohle Hafen und Bahn AG in Germany, TraXion in Denmark and TGOJ in Sweden, and this consortium is responsible for the operative part of the Älmhult-Duisburg shuttle (X-Rail, 2002/b).
4.1 The Swedish industrial organisation

This section gives a view of the Swedish intermodal industry according to the main activities performed. Many actors supply a large variety of services using their own or other companies’ resources.

The question of competition in the Swedish railway sector has been frequently discussed during the last decade. Economies of scale are important to the railway sector and competition has not solved all the problems in the industry. Implementing competition has though forced the former railway authorities, affecting the intermodal service, to improve their service. In January 1995 the Swedish parliament voted for establishing competition on the network, but competition within the intermodal sector is heavily influenced by the weak competition in the railway sector as a whole. This has resulted in a strong position for the former freight division of Swedish State Railways (SJ), Green Cargo, including Rail Combi, each operating a domestic network. New entrants such as BK Tåg and Gothia Rail Shuttle have established shuttles were there are volumes enough for full trains, where they act as suppliers of core terminal-to-terminal services. IKEA Rail is an interesting new entrant in the market, fed up with the poor quality delivered by the rail operators in the international service and thereby trying to establish a European long haul rail network, at least by possessing train slots.

Local road haulage and terminal service do not differ between domestic and international intermodal traffic, except for that hauliers generally control both pre- and end-haul domestically but only one haul internationally, while many other activities are divided among different actors according to geographical markets. The competition for local road haulage is not fierce, except in the spot market for semi-trailer traction, since most hauliers still are connected to forwarders. Close co-operation between the intermodal service provider and the local haulier reduces the competition. As an example BK Tåg and the local haulier organisation, LBC Värm-Dal, work in close co-operation to extend and enhance the service.

Rather the competition might appear at the terminal transfer activity. Potential establishers must be able to reach the intermodal rail network to guarantee business. Problems are caused by capital-intensive terminals and less densely populated countries such as Sweden face a concentration to fewer terminals. Rail Combi controls 14 out of 16 conventional terminals, offering their service to other intermodal operators. Competitors have faced problems since the deregulation in 1995, but those might be overcome, even for small competitors, like BK Tåg and Gothia Rail Shuttle. BK Tåg uses the local side-lifter for the transhipment activities at two terminals and for terminal activities in Göteborg, the company uses the terminal owned by the port authority.

To facilitate fair competition, planning of the timetable and access to the terminals has been transferred from SJ to Banverket. There is still no extensive competition, although new entrants have focused on competing for routes with large existing volumes, i.e. the competition only regards some full train shuttle routes.

Marketing aimed at shippers is divided between forwarders, shipping agents, Green Cargo and, in the future, IKEA Rail. The unattractive position as supplier of the pure terminal-to-terminal transport is clearly shown in the strategy of Green Cargo. Its ambition is to offer the shipper a complete service or a complete intermodal service door-to-door or door-to-port. The table below sums up the Swedish situation.
Figur 1  Summing up the Swedish intermodal road-rail freight industry.

<table>
<thead>
<tr>
<th>Actors → Activities ↓</th>
<th>Green Cargo Distribution</th>
<th>Green Cargo Recycling</th>
<th>Green Cargo Int. Shuttles</th>
<th>Light-Combi</th>
<th>Rail Combi</th>
<th>Swe-Kombi</th>
<th>BK Tåg</th>
<th>IKEA Rail</th>
<th>Gothia Rail Shuttle</th>
<th>TGOJ Trafik</th>
<th>Actors - Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local road haulage</td>
<td>D D D D D D D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Road vehicles</td>
</tr>
<tr>
<td>Terminal transfer</td>
<td>D D D D D D DI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Terminal w. equipm.</td>
</tr>
<tr>
<td>Other terminal services</td>
<td>D D D D D DI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Equipm.</td>
</tr>
<tr>
<td>Rail haulage</td>
<td>D D D D D D D D</td>
<td>D D I I I D D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Slot/Engine</td>
</tr>
<tr>
<td>Marketing to shippers</td>
<td>D D D D D D D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Marketing systems</td>
</tr>
<tr>
<td>Arrange the total Int.</td>
<td>D D D D D D D D I I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adm. sys. for total Int.</td>
</tr>
<tr>
<td>Arrange the core Int.</td>
<td>D D D D D D DI DI DI DI D D I I I I I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adm. sys. for core Int.</td>
</tr>
<tr>
<td>Supply of unit loads</td>
<td>D D D D D D D D D D D D D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unit loads</td>
</tr>
<tr>
<td>Supply of rail wagons</td>
<td>D D D D D D D D D D D D D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rail wagons</td>
</tr>
<tr>
<td>Supply of rail engines</td>
<td>D D D D D D D D D D D D D</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rail engines</td>
</tr>
<tr>
<td>Supply of critical staff</td>
<td>D D D D D D D D D D D D D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Engine drivers</td>
</tr>
</tbody>
</table>

Explanations: D – applies to domestic intermodal service, I – applies to international intermodal service, codes in italics only apply in exceptional cases.

The arrangement of the core terminal-to-terminal service was earlier divided according to two dimensions. The first dimension was whether domestic or international intermodal transport was provided, where the railways arranged the domestic service and the international one was arranged by ICF or Swe-Kombi. This structure has almost disappeared, due to deregulation and strategic decisions of the railway operators aiming to focus the door-to-door transport or the door-to-port transport asked for. A merger and co-operation process started to offer the shippers, hauliers and forwarders a high-quality pan-European network, i.e. both offering international and domestic service, within the same company or as a strategic alliance.

As mentioned, the former all-Swedish company, Rail Combi, merged with Cargo Net A/S in January 2002. Cargo Net A/S has established a close strategic alliance with Kombiverkehr and HUPAC (part-owners of Swe-Kombi). The aim is to improve transport quality between Scandinavia and the continent. This might show that ICF and the UIRR, former strong actors on the Scandinavian market, either slowly are disappearing, replaced by other network actors or the former partners might appear as competitors. Secondly, the other dimension focused on were the type of unit loads shipped. This division is now almost dissolved.

4.2 The European industrial organisation

The first own investigation on this matter in 1994 (Woxenius, 1994) showed a rather homogenous industry based upon if not monopolies at least a clear division of mar-
kets, although the industrial organisation varied significantly between the European countries. There are still large differences, mainly depending on how far the deregulation has evolved, but some changes concerning new entrants and changing strategies of older actors can be discerned.

On the European level, national container companies offer door-to-door services and, together with shipping agencies and forwarders, they control the very important contacts with the shippers. The ICF and the UIRR companies take a wholesaler role, although ICF occasionally sell directly to large shippers. In international transport, the forwarders decide whether intermodal transport should be used but the hauliers take a stronger role in domestic transport since they are then often contracted for a long distance haul and can in turn outsource to an intermodal operator. In general, the shippers do not specifically demand a special traffic mode (Stone, 1998) but companies with an environmental image prefer rail to a greater extent. A stronger interest in the mode of transport is also attributed to the shippers sending large volumes, particularly as full unit loads.

In the previous section it was stated that the terminal-to-terminal service was separated, firstly according to international and domestic intermodal transport and secondly according to the unit loads used in the transport chain. As in the Swedish case this generalised trend has disappeared in Europe. During previous years there has been a large number of strategic alliances and mergers within the European intermodal industry, this in order to extend the networks and to keep up the service level provided to customers. In Germany the DB AG owns on one hand 50% of Kombiverkehr, the German UIRR-company and on the other 100% of Transfracht.

Further, as described in section 2, companies such as Kombiverkehr own large shares in a large number of smaller actors, primarily UIRR-companies, or have formed strategic alliances as between CargoNet, Hupac and Kombiverkehr. This leads to two conclusions. First, the former national operators have developed their range of service from core domestic transport to being players also in the pan-European intermodal market. Change in one part of the market forces the other operators, like ICF, to adjust their strategies. Second, the progress of the deregulation process is far from equal over the whole continent. This might result in, as has been the reality in the passenger transport, schisms between different companies operating the network without the same rules. In particular, French operators such as Connex can benefit from open access in Sweden and Germany, but Swedish and German companies cannot compete on Connex’ home market.

In general, the new intermodal operators are found in the northern part of Europe and in particular as cherry-pickers in the large market for hinterland transport of maritime containers. Hence, most of them can be related to the large ports in Hamburg, Bremerhaven, Rotterdam and to some extent Antwerp (only Ferroviasped as independent operator). Finally, the existing actors have one advantage over new entrants. When assigning slots in the time table scheduling process the rule of Grandfather’s right applies, i.e., when planning a new schedule existing companies’ slots take precedence over the new entrants’ wishes of slots.

For the supply of terminal services, less densely populated countries such as Sweden and Finland face a concentration to fewer terminals while countries like France, Germany, Italy and the UK even can afford to have more than one terminal in the larger
urban areas. This also opens possibilities for new actors to enter the terminal operation business. A prerequisite is still good connections with the railway companies and the intermodal operators to facilitate access to the rail network and guarantee business at the terminal. Consequently, railway companies generally possess minority shares in the new terminal companies.

Port operators might well invest in inland terminals in the future. They usually possess the necessary competence, capital and incentives to connect to the hinterland with so-called dry ports. The trend towards networks of ports is clear in container ports where PSA from Singapore and Hutchison from Hong Kong have both bought large shares in many ports, European ones not excluded, and Hutchison has a subsidiary for inland terminals.

Supplying unit loads, rail wagons and engines are activities involving both rail operators and leasing companies. So far most of the rolling stock has been owned by the railway operators, but there is a clear tendency in Sweden like in all of Europe towards avoiding large investments through leasing engines and wagons. A clearer actor role concerning rail traction is also distinguishable with many small rail companies, often with a short-line origin.

In all, it is obvious that changes due to deregulation take place in the European intermodal road/rail freight industry. Some cherry-pickers have entered, some of them have left, while others maintain and develop their place in the market. Above all, however, the large players change strategies, enter new markets or form alliances which give much faster and more dramatic changes as well as a more scattered picture than in the monopoly days.
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