



Logistics in Germany

November 27, 2008

A growth sector facing turbulent times

The logistics sector in Germany generated revenues of EUR 190 bn in 2007. Nominal revenues have risen by an average of around 4.5% per year since 2001. This makes logistics one of the faster growing sectors in Germany. The German logistics market is the biggest in the EU with a share in turnover of over 20%.

Germany enjoys many advantages in the market for logistics. These include its relatively high degree of industrialisation, the openness of its economy, its central location, its polycentric economic structure and its high-quality, extensive transport infrastructure.

Policymakers should expand infrastructure to ensure that logistics remains a motor of growth. Removing chronic bottlenecks should enjoy the highest priority. The rail sector can be bolstered by opening up the track operations to competition; Germany leads the way in Europe in this respect. Furthermore, many competition issues still need to be resolved (e.g. the differing tax rates across the EU). Many issues are addressed in the federal government's current masterplan, "Freight Traffic and Logistics". Implementation of the plan is, however, subject to the funding situation.

There is a continuing trend towards comprehensive system solutions from a single source. Contract logistics is one of the fastest growing segments in the sector. Clients are becoming steadily more demanding. This benefits larger logistics companies with the relevant expertise. New technologies like Radio Frequency Identification (RFID) are helping to boost efficiency in the sector.

Logistics is also feeling the effects of the current economic downturn. In 2008 and 2009 nominal revenues are expected to rise by an average of some 2-3% p.a. In real terms, this means stagnation at best. The long-term growth drivers (e.g. the international division of labour) will remain intact. We forecast that the logistics sector in Germany will post average nominal revenue growth of 5% p.a. until the middle of the next decade. In individual segments (e.g. contract logistics) growth should even be much faster.

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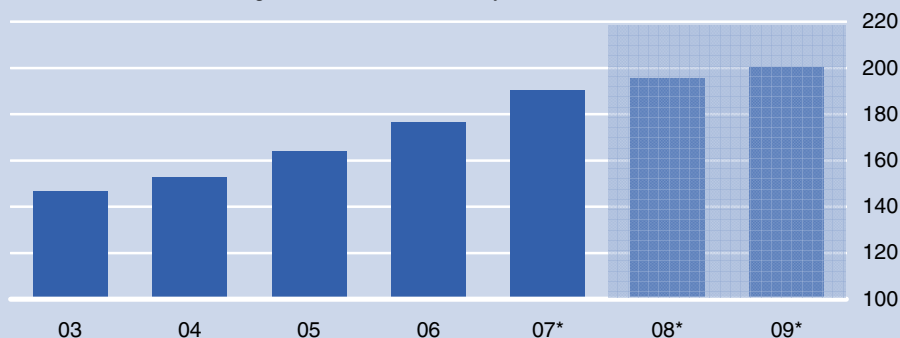
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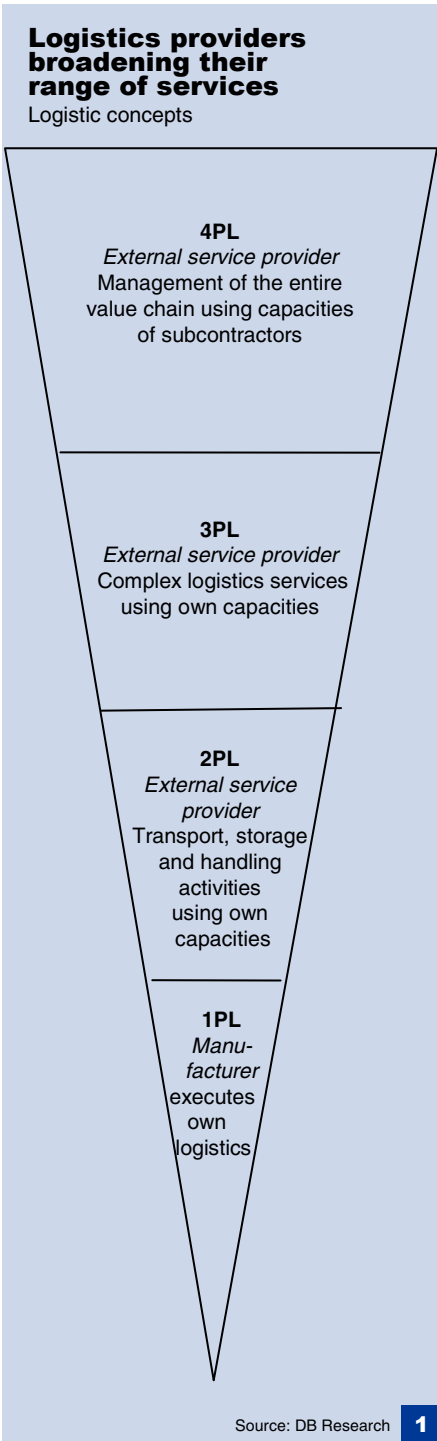
Norbert Walter

Growing market worth billions

Nominal turnover of the logistics market in Germany, EUR bn



*DB Research estimates and forecasts
Sources: Federal Statistical Office, DB Research



1. The logistics sector: Heterogeneous and expanding

In the official statistics logistics is a far less homogeneous sector than traditional industries such as mechanical engineering or chemicals. The system for classifying business activities in the European Community (NACE Codes) does not designate logistics as a single sector.

So what is logistics?

Logistics is traditionally understood as encompassing activities concerned with the transport, storage and handling of goods. It also includes the procurement of transport – a core activity of freight forwarding companies. However, this narrow definition no longer adequately describes the full range of logistics activities. The range of services provided by logistics companies has expanded constantly over the last 20 years or so. Its focus is no longer solely on the transport, warehousing and handling of goods, but can also include the associated information flow and staffing, funding and energy requirements. Logistics companies are now increasingly providing their clients with additional services, which are referred to as value-added services. The business relationship between the client and the logistics provider is often geared towards the long term and encompasses the management of complex logistics processes. In exceptional cases industrial companies outsource their entire value chain contract to external logistics providers (see chapter 3).

Outline of the differing logistics concepts

The different logistics concepts can be described as follows:

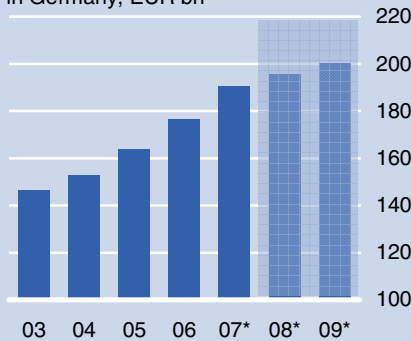
- **First Party Logistics (1PL):** Companies perform the logistics activities using their own resources. The main activities are transportation, storage and handling.
- **Second Party Logistics (2PL):** The core logistics activities are also the focus of this business concept. However, they are performed by external providers using their own resources.
- **Third Party Logistics (3PL):** External logistics providers perform a broader range of activities (value-added services, information management etc.) using their own capacities.
- **Fourth Party Logistics (4PL):** An external company performs all supply chain management activities on behalf of its client. In this case the provider does not use its own logistics capacities (e.g. fleet of vehicles, warehouses), but uses a variety of independent subcontractors.

The boundaries between the concepts cited are fluid. For years 3PL has been gaining ground at the expense of 1PL and 2PL; the fledgling 4PL segment is still comparatively small but has considerable growth potential. The shift between the concepts is due on the one hand to industrial companies concentrating on their core competencies (outsourcing their logistics activities) and on the other to increasingly complex logistics processes which are handled better by specialists with the corresponding management expertise.

Although the logistics market in Germany continues to be dominated by small and medium-sized companies the growing client demand for comprehensive solutions from a single source is resulting in the formation of increasing numbers of large system logistics providers operating across a number of regions and/or internationally; consolidation thus continues apace. The “simpler” the services being

Growing market worth billions

Nominal turnover of the logistics market in Germany, EUR bn

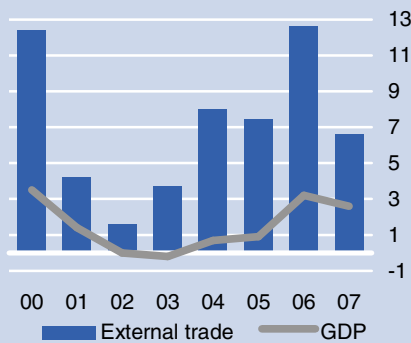


*DB Research estimates and forecasts
Sources: Federal Statistical Office, DB Research

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Trade growing fast

Real external trade and GDP growth in Germany, % yoy

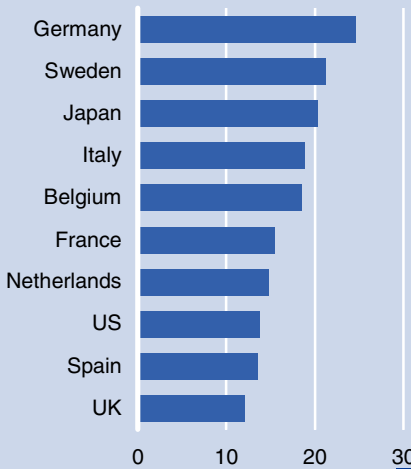


Source: Oxford Economics Forecasting

3

Germany is highly industrialised

Manufacturing share of GDP in 2007, %



Source: Oxford Economics Forecasting

4

offered, the stiffer the competition; this applies, for example, to transports of goods from A to B (see chapter 3).

Constant revenue growth in the logistics sector

We estimate that the entire logistics sector in Germany generated revenues of around EUR 190 bn in 2007. This is more than 60% of the turnover of the automobile industry.¹ The estimate is based on sales tax statistics from the Federal Statistical Office. The sector's nominal turnover has grown since 2001 by an average of around 4.5% per year (by comparison manufacturing has posted growth of 3% p.a.). This makes logistics one of the faster growing sectors in Germany. The German logistics market is the biggest in the EU with a share of over 20%.²

Freight traffic in Germany can also be used as a partial indicator of the cyclical trend in the logistics sector. Over the last ten years total domestic German freight traffic (in tonne kilometres) has risen by an average of 3.7% per year.

Growth drivers: Globalisation and outsourcing

The pick-up in globalisation automatically leads to an increase in logistical activity. The most important events in this connection were the fall of the Iron Curtain, the economic blossoming of many developing countries and emerging markets, along with China's entry into the WTO in 2001. Industrial companies have already been exploiting the opportunities presented by the international division of labour for years. As they establish production facilities outside Germany they benefit from local factors (e.g. low wage costs) and open up new markets. The concentration on core competencies continues to result in the outsourcing of parts of the value chain, which leads to increased transport activity. The booming global economy of recent years also stimulated the logistics sector.

Overall, global trade has grown nearly twice as fast as global GDP since the 1990s. Certain modes of transport such as container shipping have grown no less than three times faster than GDP.

2. Logistics in Germany: Local conditions and global challenges

Germany's advantages in the logistics business

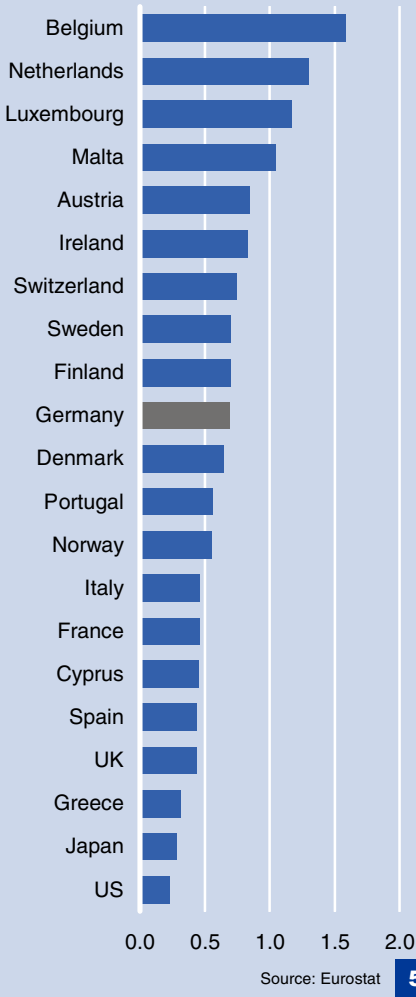
Germany has a number of excellent assets to offer the logistics sector. These include the high degree of industrialisation compared with its western European neighbours. Demand for transport and other logistics services is naturally higher from industrial sectors than from the service sector. Over recent years industrial production in Germany has – on average – risen much faster than the economy as a whole. Leaving that aside, the size of the German economy alone makes the country attractive for logistics companies. The high per-capita incomes in Germany are also a positive factor for logistics firms as the local sales potential for industrial and trading companies depends on the size of disposable household incomes or private consumption. The latter has however risen by only 0.2% p.a. in real terms over the last five years in Germany, making the country far less dynamic than the euro area as a whole (growth rate of 1.5%).

¹ The literature contains widely differing figures for the revenues of the logistics sector. This is obviously due to the above-mentioned difficulties regarding the statistical demarcation. According to our definition the logistics sector encompasses the NACE Codes 60 (excluding 60.2, but including 60.24), 61 (excluding 61.20.1 and 61.20.4), 62 (in part), 63 (excluding 63.3) and 64.12.

² See Die Bundesregierung (2008). Masterplan Güterverkehr und Logistik. Berlin.

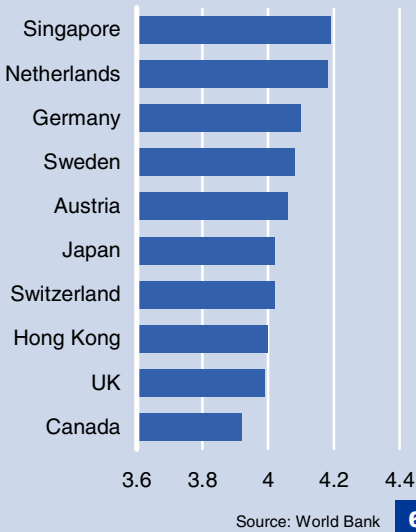
Germany is the most open of the large economies

External trade/GDP, 2006



Top 10 in the Logistics Performance Index

Scores between 0 and 5



This has been more than offset by the boom in the industrial sector and in foreign demand.

The German logistics sector also benefits from Germany's integration into the international economy. No other G8 member has ratios of exports and imports to GDP that are as high as Germany's; Germany is the world's biggest exporter and its external trade is expanding a great deal faster than GDP. One central (in the truest sense of the word) advantage that Germany possesses as a logistics hub is its location at the heart of Europe with nine countries as immediate neighbours. This location makes Germany the most important transit country in Europe and offers good opportunities for international freight handling.

Its relatively polycentric economic structure compared to other countries (e.g. France) also makes Germany interesting for domestic and foreign players in the transport business, as the result is an increase in transport routes. Since mid-1998 companies from the EU-15 have been allowed to conduct freight transport activities within other EU states (so-called freedom of cabotage).³ Since 1999 the cabotage volumes in Germany have risen by around 60%. Germany is the most important market for such cabotage traffic after its larger (in terms of land area) neighbour, France. Nearly 25% of all cabotage journeys within the EU are carried out in Germany. Of course the presence of foreign providers in the German market intensifies competition in the plain-vanilla transport business.

Finally, the transport infrastructure in Germany is one of the country's key assets from a logistical point of view. Germany scores well in an international comparison in terms of both the quality and scope of its transport infrastructure, even though in recent years traffic volume has expanded faster than the corresponding infrastructure. The country has one of the most extensive motorway and rail networks in Europe (see figure 7). Its airports, seaports and inland ports are among the biggest and most up-to-date in Europe, and the Rhine is by far the most important inland waterway in the EU.

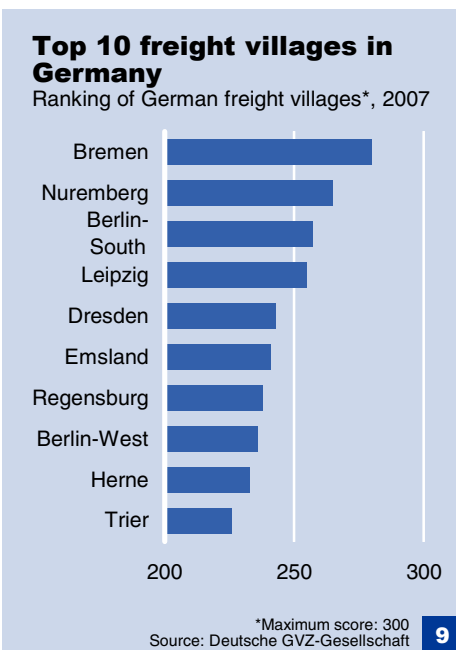
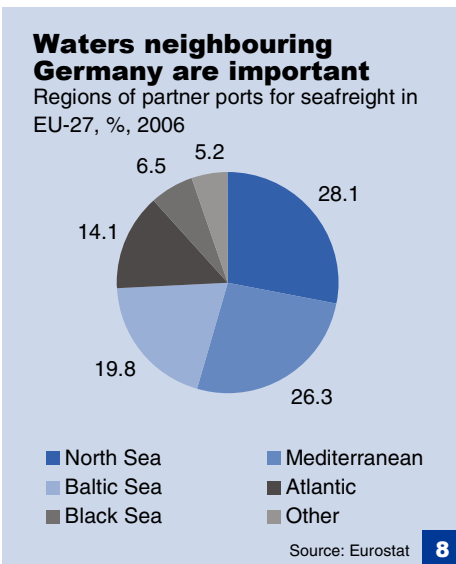
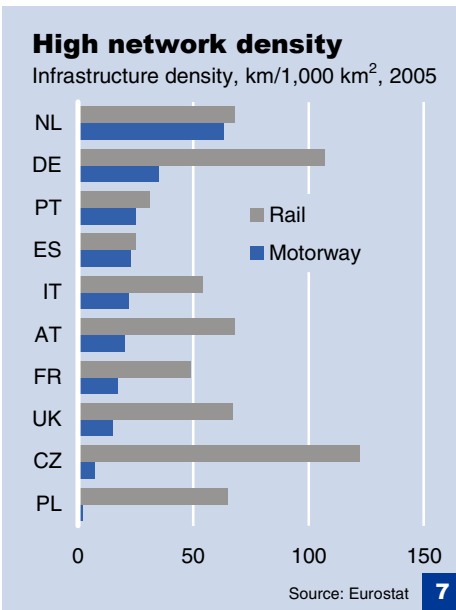
Germany's assets as a logistics location are confirmed by a 2007 World Bank report. The World Bank surveyed the attractiveness of 150 countries as logistics locations and devised the Logistics Performance Index (LPI) to rate their attractiveness. Germany occupies third place in this ranking behind Singapore and the Netherlands. The LPI incorporates many different criteria that are key to the success of the logistics sector.⁴

Numerous logistics centres in Germany

Germany thus represents a favourable environment for the logistics sector. The polycentric structure of the economy means that it comes as no surprise that many logistics facilities with differing specialties have managed to develop. The two seaports in Hamburg and Bremen (i.e. Bremerhaven) are Germany's "Gateways to the World" and with their links to other modes of transport they are the most important logistics locations in the north of the country. In 2007 they accounted for around 56% of all freight turnover at German seaports; their share of container turnover amounted to no less than

³ Transition periods apply between the EU-15 and new EU member states until 2010.

⁴ The World Bank (2007). Connecting to compete. Trade Logistics in the Global Economy. Washington. Criteria include customs regulations, infrastructure, goods handling and local costs.



99%. But smaller ports of the North Sea and Baltic Sea are also becoming more important, since short-haul maritime traffic in the EU, for example, has been rising for a number of years; traffic rose by an average of 3% per year between 2000 and 2007.

The Rhine-Ruhr, Rhine-Main and Rhine-Neckar regions are among the major logistics centres with a high degree of intermodality, due in no small measure to their considerable economic vitality. Nearly 90% of air freight traffic in Germany is processed via the airports in Frankfurt, Cologne/Bonn, Leipzig/Halle and Munich. The Berlin conurbation possesses the potential to expand its role as a regional hub for traffic heading towards eastern Europe.⁵ The partially decentralised intermodal freight villages (FVs) in Germany are becoming more important for the efficient dovetailing of different modes of transport, and they help to achieve the optimum use of load capacities. Locating their facilities near to such FVs is appealing for logistics firms and industrial segments that involve high levels of freight transportation.

Modal split: Road the most important means of transport

Over the last 60 years or so there has been a major shift in the breakdown of overall freight volume across the individual modes of transport (the modal split) in Germany: the road segment has steadily increased at the expense of rail and inland waterways. In 1950 the share for rail still came to 56% and for inland waterway it was nearly 24%, whereas the road share came to only around 20% then. Today, however, the road share of the modal split is 70%, whereas rail (nearly 18%) and inland waterway (about 10%) trail a long way behind. The main reasons for the gains made by road transport are the flexibility and speed of trucks compared to other modes of transport. The ongoing shift in the production structure of the economy away from traditional bulk goods to high-quality products (goods structure effect), the growing logistics demands of customers (logistics effect) as well as the increase in small consignments (heavily associated with the rise of e-commerce) were also pivotal to the success of road transport. In addition, the road infrastructure was expanded quickly and extensively following World War II. The competition within the road freight segment has made a not inconsiderable contribution to the success of the system. International road freight volumes have risen particularly sharply over recent years.

Rail renaissance in Germany

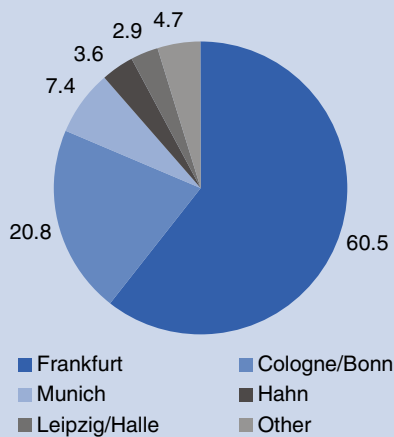
A turnaround in the modal split trend has, however, been looming for a few years. The sharp increase in the price of diesel (+50% since early 2004) and the truck toll contributed to goods traffic growing much more slowly than rail in recent years. Between 2002 and 2007 rail freight volumes in Germany grew at an average of some 8% per year (road freight rose by 5%). This was largely due to private rail companies, which increased their traffic by an average of 40% per year since 2002. They now command some 20% of the rail freight market (2003: 7%). This success of private rail operators in Germany shows that competition in the rail sector can have positive impact the entire transport sector. In many European countries action still needs to be taken.⁶ Rail plays a hugely important role in

⁵ See Heymann, Eric (2008). Verkehrsdrehscheibe Berlin kommt auf Touren. Deutsche Bank Research. Aktuelle Themen 417. Frankfurt am Main.

⁶ See Heymann, Eric (2006). Competition in European railway market: Morning has broken. Deutsche Bank Research. EU Monitor 39. Frankfurt am Main.

FRA the undisputed No. 1

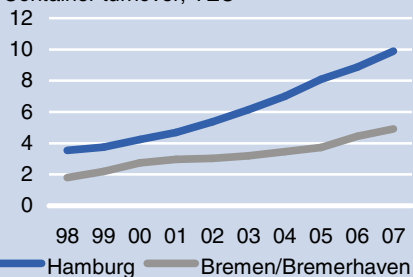
Share of air freight in Germany, %, 2007



Source: ADV **10**

Hamburg tops the table

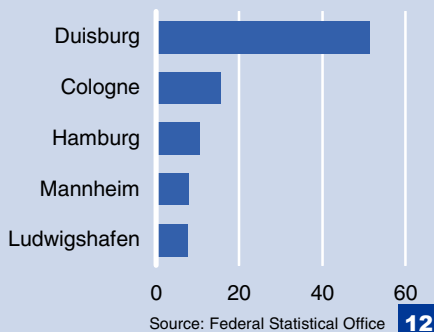
Container turnover, TEU*



* Twenty Foot Equivalent Unit
Source: Port of Hamburg **11**

Duisburg: Germany's biggest inland port

Freight turnover at German inland ports, million tonnes, 2006



Source: Federal Statistical Office **12**

the seaport hinterland transport segment, which is increasingly developing into a bottleneck at many major German ports. In turn, this traffic is also important for the rail segment: over 25% of the freight transported by rail inside Germany in 2007 was conveyed either from or to Germany's major seaports.⁷

Air freight and sea freight expanding

Given its small share of total domestic freight traffic in Germany air freight appears quite insignificant at first glance. This is also due to the fact that air freight comes into its own primarily over long distances. Since 2000 freight turnover at Germany's main airports has, however, risen by 43% or more than 5% per year. Air freight is thus one of the fastest growing modes of transport, both in Germany and worldwide. The colossal significance of the sector is also clearly illustrated by air freight's share of the global trade in goods, which comes to between 35% and 40% in monetary terms. So it is mainly high-value and usually time-sensitive items that are transported by air.

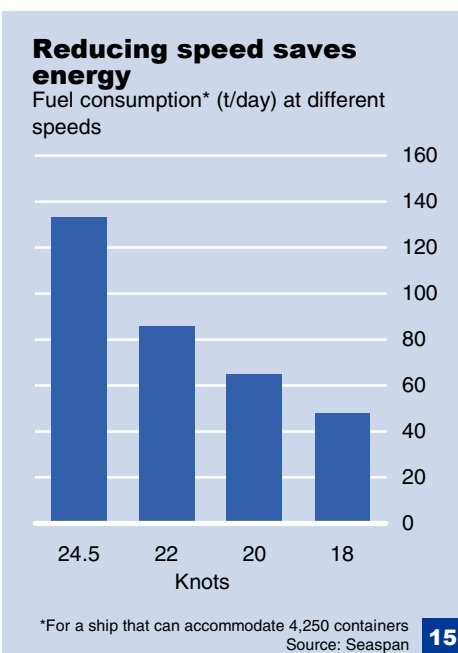
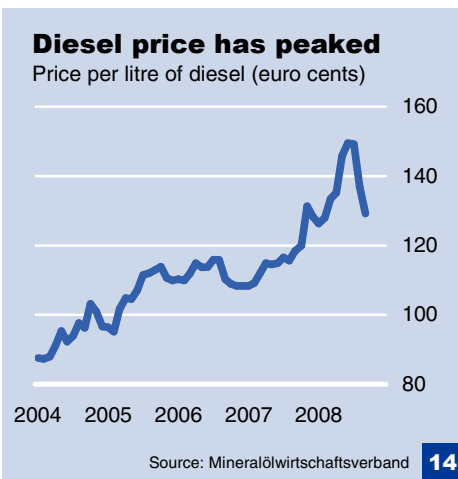
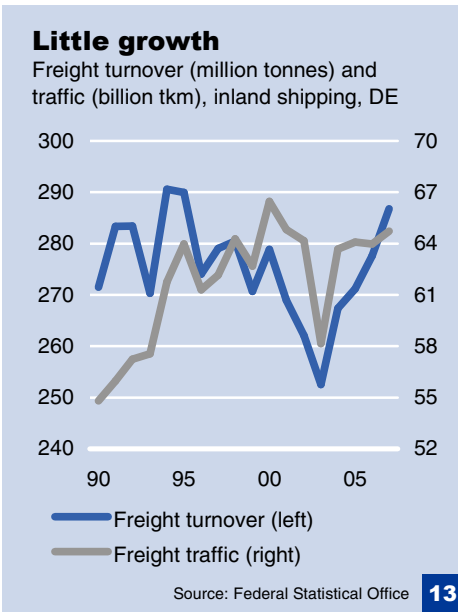
By contrast, over 90% of international freight traffic in volume terms is transported by sea. Sea freight thus constitutes the backbone of globalisation. Global sea freight traffic has increased by an average of 3.8% per year since the mid-1990s. In Germany freight turnover at seaports rose by 3.6% per year over the same period. The sea freight segment that has posted by far the fastest growth in recent years is container shipping: global container turnover has expanded by nearly 11% per year on average since 1995. Germany has managed to claim its fair share of the growth. Container turnover at German ports also rose by a strong 10.2% p.a. between 1995 and 2007.⁸ The main reasons for the success of container shipping are the short loading and unloading times for ships and the favourable conditions for forwarding consignments using other modes of transport; container standardisation makes this possible.⁹ By the middle of the next decade global container turnover should rise by 9% per year on average.

Inland shipping: The slowest growing segment

According to Eurostat, Germany is the biggest inland shipping market in the EU with a share of 46% of freight traffic. Duisburg is home to Europe's largest port that caters exclusively for domestic shipping. In Germany most inland ports are well connected with other modes of transport. In the seaport hinterland transport segment, too, inland shipping performs a small but significant function as a feeder and forwarder of goods to their final destination. This has played a not inconsiderable part in the steady increase in container utilisation in domestic shipping as well.

Overall, inland shipping has nevertheless registered the lowest growth of all modes of transport in Germany in recent years. Freight traffic was roughly the same in 2007 as in 1995.¹⁰ The main reasons for this are the above-mentioned goods structure and logistics effects along with other factors. Domestic shipping is particularly susceptible to external factors such as extremes of weather. Freight

⁷ See Walter, Kristina (2008). Eisenbahnverkehr 2007: Güterverkehr wächst – Personenverkehr stagniert. Wirtschaft und Statistik 5/2008. Wiesbaden.
⁸ See Winter, Horst (2008). Seeverkehr 2008. Wirtschaft und Statistik 7/2008. Wiesbaden.
⁹ See Heymann, Eric (2006). Container shipping: Overcapacity inevitable despite increasing demand. Deutsche Bank Research. Current Issues. Frankfurt am Main.
¹⁰ See Winter, Horst (2008). Binnenschifffahrt 2007: Güterbeförderung bei fast 250 Mill. Tonnen. Wirtschaft und Statistik 8/2008. Wiesbaden.



traffic on inland waterways fell 10% during the freak summer of 2003, as extremely low water levels significantly limited the navigability of key waterways.

Global challenges for the logistics sector

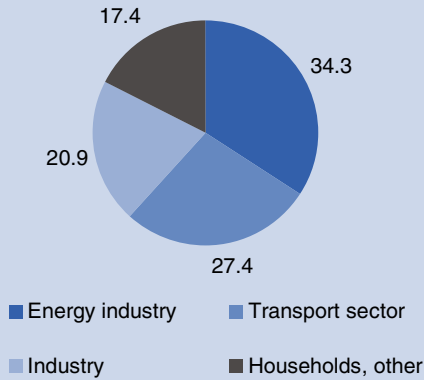
Logistics companies in Germany and Europe currently face a number of challenges – some of them global:

- The current deterioration in the macroeconomic environment is having a negative short-term impact, as it squeezes demand for logistics services. We forecast that global GDP growth rates will remain below their averages of the last five years up until 2010. In phases of cyclical weakness the problem of overcapacity – especially in the transport segment – becomes more apparent.
- In phases of cyclical weakness the liberalisation of global trade often progresses more slowly. National interests and the call for protectionist measures then take centre stage. Besides tariff and non-tariff trade barriers security-driven measures (e.g. comprehensive examination of containers entering the US) can also hinder the global trade in goods and thus also the logistics sector.
- On top of this, energy prices have risen sharply over the last few years. Essentially all modes of transport are affected by these cost increases. The transport sector has limited scope for making short-term adjustments to higher fuel prices. The long service lives of trucks, rolling stock, aircraft and ships mitigate against achieving rapid improvements in efficiency. However, cutting the speed at which, for example, a ship travels can considerably reduce energy consumption.¹¹ Despite the current, cyclical easing in the oil price we expect that the era of sustained low energy prices is over. The demand for energy is likely to rise faster than supply for the foreseeable future. Higher energy prices are likely to make transport costs a more important factor in the choice of business location going forward. In certain sectors there could be a reversion to locations closer to home – with the corresponding repercussions for the logistics sector. A sea-change in the globalisation process is, however, unlikely.
- Over the next few years more measures motivated by environmental and climate policy concerns will impact the logistics and transport sectors. CO₂ emissions in the EU transport sector rose by nearly one third and thus faster than in every other sector between 1990 and 2005. The transport sector is now responsible for over 27% of all CO₂ emissions in the EU. This is why the sector is becoming the focus of even greater environmental policy scrutiny. Items on the political agenda include the inclusion of the airline and shipping sectors in EU emissions trading as well as an increase in Germany's truck toll (from an average of 13.5 to 16.3 cents per kilometre) along with an expansion in its differentiation. In eastern Europe the petroleum tax is likely to be increased in the next few years. The bottom line is clear: mobility is to be made more expensive. The higher costs are likely to be only partly offset by boosting efficiency.
- Bottlenecks in the transport infrastructure with regard to quality and capacity are reducing the efficiency of logistics processes all over the world. Financial restrictions on government budgets are

¹¹ Of course the other side of this coin would be higher costs of capital and labour.

Transport sector is the second biggest polluter

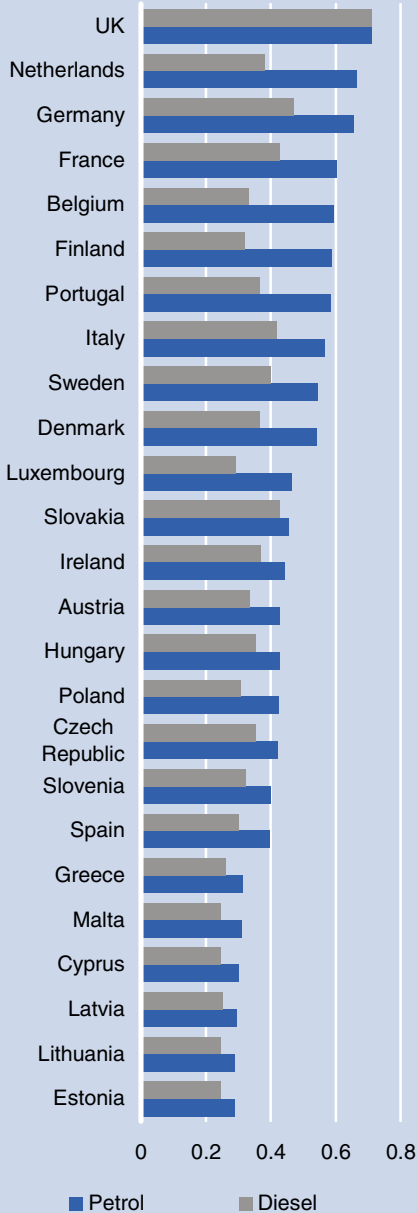
Share of CO₂ emissions, EU-27, %, 2005



Source: European Commission **16**

Fuel tax rates vary across Europe

Per litre of fuel (EUR)



Source: Mineralölwirtschaftsverband **17**

usually the reason why these bottlenecks cannot be removed quickly. The gap cannot be plugged without private capital.

- In Europe there are still a number of competition issues relating to the logistics sector that need to be addressed: there are, for example, large differences between petroleum tax rates within the EU. Compliance with social provisions such as driving time limits and compulsory rest periods is monitored with varying levels of rigour. Different modes of transport do not receive the same treatment within individual countries, either. This applies to tax rates, the attribution of external costs of transport and the contribution of each mode of transport to overall infrastructure funding. It therefore comes as no surprise that the lobbies for the individual transport segments have accused each other for years of enjoying state subsidies. And last but not least, extending EU emissions trading to the airline and shipping sectors – depending on the form it takes – could result in European players being placed at a major competitive disadvantage.

In many logistics segments staffing shortages are becoming increasingly apparent. In Germany this applies not only to truck drivers but also to engineers. Competition for qualified staff is getting tougher. In Germany some 7,000 engineers specialising in logistics are being trained each year; that is 5,000 too few, according to estimates from Germany's logistics trade association (Bundesvereinigung für Logistik – BVL).¹²

Policymakers must accelerate infrastructure expansion

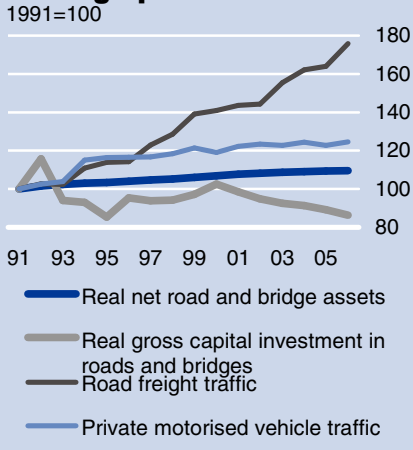
In order for logistics to remain a motor for growth and employment in Germany, politicians should first and foremost create the necessary conditions in transport infrastructure. Although Germany possesses a very extensive road and rail network, in the last few years the volume of traffic in the road freight segment in particular has risen much faster than net investment in roads and bridges.¹³ According to the latest forecast from the Federal Transport Ministry (BMVBS), by 2025 Germany will see increases in passenger traffic of 18% and in goods traffic of some 70%. The danger will thus increase that road infrastructure develops into a factor limiting economic growth.

The chronic funding shortfalls in the public sector as well as the priority that consumption expenditure has over investment in the public sector are the main reasons for the widening infrastructure gap. More private funding is required – and possible, as shown by the initial experience gathered with private BOT models in the roadbuilding segment. The conditions in Germany are ideal: traffic volumes are high. The motorway network is very extensive; there are just a few gaps to be plugged and extra lanes that need to be added. Traffic projections are also seen as relatively reliable. With Germany's truck toll system the principle of user financing is also being implemented. Efforts should be made to extend the toll to other road users – i.e. car drivers; however, this should be offset by reductions in other taxes and duties. The earmarking of all toll revenues for road construction would also be desirable. The acceptance of road usage fees will of course not increase if toll revenues steadily rise (they rose 15% between 2005 and 2007), while expenditure in the corresponding infrastructure stagnates at best. In expanding the transport infrastructure politicians should

¹² Vgl. Jürgens, Philip (2007). Logistik profitiert. Handelsblatt November 19, 2007.

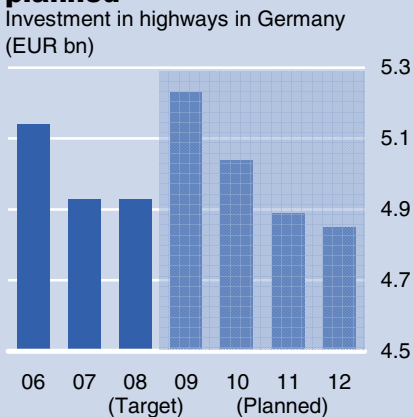
¹³ See Alfen, Hans Wilhelm et al. (2006). Privatisation options for the German motorway network. Deutsche Bank Research. Current Issues. Frankfurt am Main.

Road: Supply and demand drifting apart



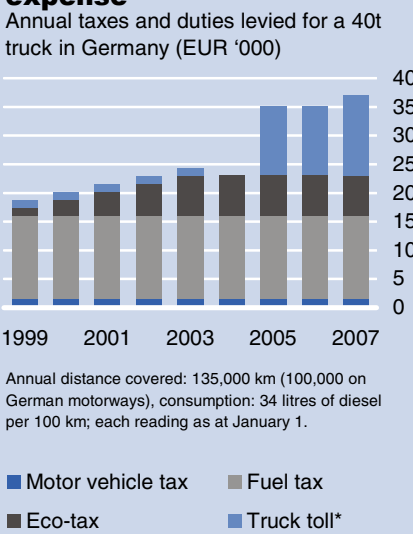
Sources: DIW, DB Research **18**

Declining road investments planned



Source: Pro Mobilität **19**

Truck tolls are an added expense



Annual distance covered: 135,000 km (100,000 on German motorways), consumption: 34 litres of diesel per 100 km; each reading as at January 1.

*Levied for motorway use Source: BGL **20**

concentrate on projects that generate the greatest transport benefits given the scarcity of public funds.

Shifting goods traffic from road to rail is an objective that politicians have advocated for decades. Besides creating the corresponding infrastructure it requires that the rail network in particular be opened up to more competition. The success in Germany shows what this can achieve. Since rail's specific advantages accrue primarily over long distances competition has to be boosted further throughout Europe. Efforts also need to be made to harmonise the differing rail systems within the EU. At the same time politicians should not lose sight of the fact that the majority of the additional freight will still have to be transported by road in future.

Many of these issues are addressed in the federal government's current masterplan, Freight Traffic and Logistics. The thrust of this masterplan is certainly right – though some critical details still need to be modified. Implementation of the plan is of course subject to the funding situation.

3. Current trends in the logistics sector

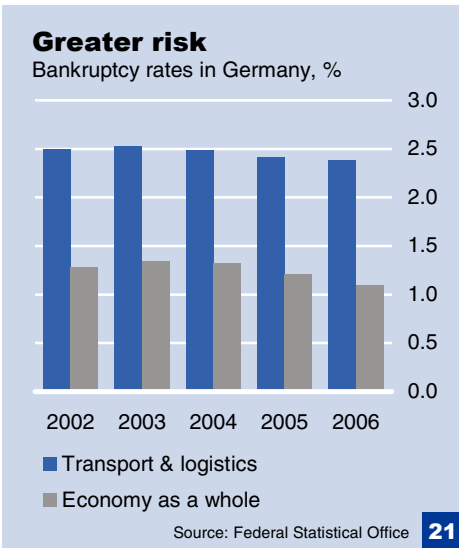
Besides these overarching developments there are also various trends to be found within the logistics sector. Expenditures for personnel costs are on the increase. This, combined with the expected higher levels of fuel and energy prices in the medium term, forces logistics providers to respond. These costs are driving the consolidation forces in the sector and limiting the centralisation of inventory management.

Personnel costs on the rise

Personnel represents the biggest cost component for goods transported by road, even exceeding the expenditure on fuel. Even in an era of booming oil prices the sector sees the personnel segment driving up costs for 2008 at a nearly equal pace. The tightening of legislation for truck drivers in April 2007 alone – which focused on changes in driving times and rest periods, intensified monitoring of their observance and the obligatory installation of a digital tachograph – imposed substantial additional burdens. It is calculated that Germany will need up to 50,000 additional drivers to comply with the rules. For this reason, the industry is intent on enhancing the image of truck driving as a career. According to estimates put forward by Germany's Fraunhofer Institute, the costs of the above mentioned legislative changes for the sector add up to about EUR 4.7 bn per year, i.e. 10% of the total costs for the carriage of goods by road. In addition, the age structure of Germany's commercial vehicle drivers bodes ill: only 2.5% of drivers are aged 25 or younger, while 30% are over 50. This means that within a few years the demand for drivers will increase dramatically.

Sector consolidation pressure rising

The transport sector is dominated by small and medium-sized enterprises (SMEs) and is fiercely competitive. Since pure-play transport services are very homogeneous, suppliers mainly compete on price. The price pressure in this business is correspondingly high and margins are low. Rising price pressures – whether from increases in fuel, toll or personnel costs – increase the risk of insolvency for many companies. While large freight forwarders can hold their own even under less favourable conditions thanks to economies of scale and efficiency gains, SMEs are impacted severely. They hardly can survive any narrowing of the already slim



margins. The insolvency ratio in the sector is disproportionately high, and it is expected to climb further in the near future. Companies spared bankruptcy may be taken over by larger players in some cases. The hitherto very fragmented sector is gradually undergoing consolidation. In 2006 there were only 18 mergers and acquisitions for every 1,000 companies with annual sales of over EUR 5 million. In the manufacturing sector the figure is 37 and in the services sector as a whole the number is no less than 57.¹⁴ Nevertheless, in the long run the transport market is likely to retain its SME structures owing to the low barriers to market entry. Note, too, that the vehicles of companies that go out of business are not taken off the road but are sold to competitors. This means that insolvencies result in an only moderate reduction of capacities. The price pressure remains high.

Centralisation of inventory – limits in sight

More and more logistics projects give top billing to the centralisation of inventory. Regional hubs in a well-developed infrastructure aim to save costs by bundling intermodal traffic flows and achieving higher transport load factors. Furthermore, benefits accrue from other local advantages such as lower wage costs; reserve stock levels are cut back in general; and reduced fixed costs generate economies of scale. Moreover, the consolidation phase anticipated in the sector suggests that the increasingly large companies will invest in central warehousing facilities to exploit economies of scale.

Of course there are limits to the centralisation process, for the demand for transport rises in line with an increase in centralisation. This means that as fuel prices and personnel costs for drivers head north the advantages of central warehouses have to be reassessed and weighed up against incremental transport needs.

Transport from A to B – and more

Logistics has always meant more than merely transporting goods from A to B. Transport is part of the core business of the sector along with the handling and storage of goods. In Germany, transport generates over half of total logistics revenues. Furthermore, it is a factor at the planning stage, with the focus on strategic issues of procurement, production and distribution, managing information flows between producers and suppliers, and disposing of waste products or handling the processing of returns. The range of activities is constantly growing. Two trends may be observed:

First, value-added services – i.e. additional services offered by a logistics company – are gaining significance. With innovative services, the forwarding agent offers customers that “little bit extra” that may be the crucial factor in winning a contract. The driver of innovation is the competitive pressure weighing on the company. Customised value-added services enable providers of simple logistics services in particular to position themselves individually in the market and differentiate them from their peers. The scope of such additional services ranges from handling payment transactions, stocking supermarket shelves and performing final quality controls on products and goes as far as cutting steel beams to customer specifications in the logistics provider’s own warehouse.

Second, logistics providers are becoming increasingly integrated into their customers’ production processes. In this way, they broaden their fields of competence and metamorphose into complete system

Examples of value-added services:

- Handling payment transactions
- Training customer staff how to handle special products (e.g. hazardous goods)
- Quality control of customer products
- Property and facility management
- Removals management
- Assumption of assembly jobs
- Development of information systems and databases for customer-relevant information
- Shelf-stocking services in retail trade
- Product refinement (e.g. cutting steel beams to customer specifications, installation of software on stored computers)
- Packing of customer products
- Processing of returns

¹⁴ See IKB (2007). IKB Branchenbericht. Transport und Logistik.

operators. While pure-play freight forwarders face price-aggressive competition due to the interchangeability of their services, system operators offer comprehensive and, above all, differentiable suites of services. This allows them to compete on their product instead of on price and thus achieve higher margins. This also gives them better protection from new rivals, for the expanded competencies which a system operator has to acquire in the first place represent higher barriers to market entry. Extensive investments in proprietary logistics real estate (warehouses, handling facilities), personnel and sector-specific expertise are needed. However, as soon as a company has established itself in the market, it benefits from stronger customer ties and is less sensitive to cyclical weak spells and exogenous cost drivers. For example, rising fuel prices weigh on pure-play freight carriers more than on complex system logistics operators, for the latter face less price pressure and thus are more likely to be able to pass on higher costs to their customers. All in all, greater growth opportunities are in the offing since companies are increasingly interested not only in cutting costs but also boosting their productivity when they outsource logistics services. They want to free up resources for their own areas of competence and assign logistics jobs to companies whose core competencies lie in the logistics sector.

Full-range customer service with individually tailored solutions

Contract logistics: The provider's most complex challenge

Full, permanent outsourcing of logistics processes to a broadly based system operator is referred to as contract logistics. In contract logistics, the provider offers the customer a full range of services and tailors solutions individually to fit the customer. Processes are developed in close collaboration between the business partners, so only a small proportion of the services can be sold as standardised packages. The contract logistics provider is closely integrated into the customer's systems: there is a strong expansion of both the area of responsibility conferred on the provider and the latter's access to the customer's internal business processes and activities. For instance, a logistics firm is already in the loop from the very moment a third party places an online order with the customer and can thus start to procure the parts required immediately.

Transparency requires relationship of trust between business partners

The close business relations in contract logistics frequently develop over time from already existing links between two business partners. This lays the groundwork for a relationship of trust. The increased transparency that inevitably comes with contract logistics is then no longer considered the intrusion of an outsider but as an opportunity to enable a smooth flow of goods.

In contract logistics there are two distinct models: offers of specific services (*individual-customised*) are based on a higher degree of specialisation and individualisation of the solutions sold. The model enables sizeable margins to be earned and often goes hand in hand with a focus on specific sectors, niches and/or regions. Standardised services (*mass-customised*), by contrast, offer greater growth potential, because solutions may be sold to several customers with a minimum of additional expense. Services are standardised and sold as modules.

A certain amount of financial scope is fundamental to a company's development into a contract logistics provider, since firms often have to position themselves internationally. Given the close ties between logistics companies and their clients some aspects of the investment must be customer-specific, i.e. they are only of value in the context of the relationship between the client and the contractor. One good



example is an investment to set up a warehouse facility near one customer but far away from other potential customers. If the business relationship is terminated, such an investment becomes worthless. Depending on the size of the investment and the share of specific investments, contract logistics harbours greater risks. This makes it a model that can primarily be adopted by large, financially healthy companies. The crucial factor for smaller firms keen on broadening their operating base and diversifying their product beyond mere transport services is to position themselves strategically in the market. They can either offer their services to the big logistics players as subcontractors or else specialise heavily in a single niche and seek to establish direct contact with the end-customer. Direct business relations with the end-customer enable them to establish strong customer ties and thus stabilise their own business situation. There is a plethora of possibilities to specialise (e.g. hazardous goods handling for the chemicals industry; this requires special equipment and in some cases specific certification). Alternatively, companies can overcome their lack of scale and financial strength by entering cooperative ventures with other smaller firms. In such cases the standardised services (*mass-customised*) model is also conceivable as a suite comprised of many individual services.

Contract logistics is a growth driver in the sector. The Fraunhofer Institute estimates that the potential market in Europe has a volume of EUR 313 bn. But only 25% of this volume has been tapped so far – quite unlike the market for pure-play transport services in which the outsourcing potential is slowly becoming exhausted. Contract logistics is expected to post growth rates in the low double digits also in the years ahead.

Cross-company planning should boost efficiency

Competition between supply chains instead of companies?

We consider cross-company management of the value chain – supply chain management – as a component of a contract logistics provider’s service offering. The logistics provider assumes responsibility not only for a customer’s entire internal logistics processes, but also for the coordination of activities with the external partners involved. This cross-company planning is aimed at boosting the efficiency of the entire value creation system. One way of going about this, for example, is to develop common strategies for deciding on the regional distribution of warehouse facilities. At the operating level, optimised route planning across corporate boundaries, for instance, minimises the number of trips by empty transport vehicles. The complexity of the supply chains in some industries (GM Europe, for example, maintains business relations with about 2,000 suppliers for production facilities in nine European countries)¹⁵ highlights that a functioning supply chain has become a major key to success. Competition on costs arises all along the value chain.

4PL is a growth opportunity for companies large and small

In some cases, customers may demand of external logistics providers that, for reasons of neutrality, they refrain from using their own capacities to perform the tasks when the time comes to select subcontractors. In this case the duties are confined purely to planning and management of the logistics activities along the value chain. Fourth Party Logistics providers (4PL providers) concern themselves exclusively with organising and coordinating activities along the value chain and hire subcontractors – unlike 3PL providers – without performing transport services themselves. Just like a

¹⁵ See Cardaun, Uwe (2008). Wertewandel in der Logistik. Automobil-Produktion.

contract logistics provider, the 4PL provider is the company's sole contact in all logistics matters (one-stop-shopping concept). Finding subcontractors is wholly the responsibility of the 4PL provider. 4PL is also deemed a major growth field in the industry, the boundaries between 4PL and contract logistics being fluid though. Small logistics providers can establish themselves as subcontractors for the big 4PL providers. By contrast, large companies benefit from their worldwide resources.

Intra-company trends

The objective of saving costs by outsourcing logistics processes conflicts with the objective of boosting performance. Logistics providers respond to this challenge in various ways to satisfy the more demanding requirements:

They attempt to standardise their solutions as much as possible, provide services for several customers via one and the same investment in infrastructure, expertise and staff, and benefit from the related economies of scale. **Standardised processes** can be sold more easily in bulk than customer-tailored solutions. However, there are narrow boundaries on the scope for standardisation particularly in the growth field of contract logistics.

As standardisation progresses, the automation trend in the industry continues unabated, but some experts say it is gradually slowing down. The primary objective of **automation** is to cut costs.

Electronic systems control and manage inventories; fully automatic order-picking systems (picking robots) perform what used to be manual jobs. The technology deployed is becoming increasingly autonomous, enabling staff reductions and cost savings. But since greater importance is now being attached to service aspects as a whole and in addition the automation potential in many areas has already been exhausted, the trend is petering out. One of the reasons for this is that, despite the increased autonomy of modern robots, full automation inevitably results not only in lower costs but also a reduction of flexibility. Standard routines are not able to handle (customer-)specific business processes.

All the same, **information logistics** and thus information technology are continuing to grow in importance versus pure-play transport logistics in the sector. For instance, transport routes are being optimised dynamically in real time by factoring in traffic jam data, and electronic logistics marketplaces are being created on the internet to match up supply and demand for transport capacities with the greatest degree of transparency possible. The primary objective of IT support for logistics processes is to boost capacity utilisation.

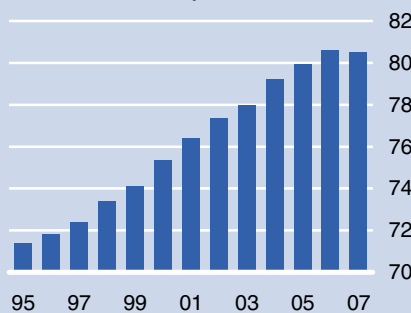
The **just-in-time** concept has been in use for many years now in many sectors of industry (e.g. in the auto industry). Companies synchronise the procurement of inputs required for their production processes, so they only have to keep smaller inventories on hand and can shorten their order-to-invoice times. All in all, the concept reduces the cost of tied-up capital, but it boosts transport costs since the transport volume per shipment decreases while transport frequency increases. As a consequence, rising transport prices limit the potential of this strategy.

No way around RFID in logistics

As global cooperation in value creation has been increasing, many companies have started to look into **Radio Frequency Identification technology** (RFID; see box "How does RFID work?"). According to a survey conducted by the University of

Capacity utilisation rising

Loaded kilometres as a share of total distance travelled by German trucks, %



Sources: KBA, BAG

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How does RFID work?

The components of an RFID system communicate without physical or sight contact via electromagnetic fields. This form of information exchange differentiates RFID both from other types of information systems such as the bar code or contact chip card, as well as from radio-based systems such as Bluetooth.

In logistics systems, RFID chips are attached to pallets, for example, so when they pass through a gateway they automatically transmit the information on the incoming products to the inventory management system.

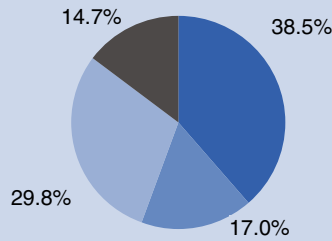
First and second-order effects argue for RFID

It is not the aim of RFID technology to crowd out the bar code. In fact, the essence of this technology can really only be understood in a wider context than as possible competition to the bar code. As an enabling technology RFID stands for a comprehensive concept all along the value chain which impacts many areas of business via two fundamental effects.

Initially, RFID drives the further automation of existing processes. This “effect of the first order” (or “automation effect”) boosts the efficiency of innovative companies and thus improves their competitive position. In the medium term, RFID leads to an expanded service offering (e.g. tracking and tracing). This “effect of the second order” (or “transformation effect”) contributes to the innovative strength of the economy as a whole.

Only 1 in 7 (still) says no

“Is RFID being used in your company?”, % of respondents, 2008



Sample: 265 German companies

- Yes
- Planned; within 2 years
- Usage would be beneficial
- Usage would not be beneficial

Source: IIG Freiburg **24**

RFID is not a self-sustaining entity

The deployment of RFID alone does not generate any positive returns for the logistics provider. Success hinges on three conditions:

1. RFID must be very widespread along the value chain.
2. As things stand today there is still no cheap standard solution for RFID. For this reason, manufacturers, traders and logistics providers have to coordinate their infrastructure in collaboration with the respective software houses.
3. Since the costs and benefits of RFID deployment can be seen at various stages of the value chain, manufacturers, traders and logistics providers have to work out the costs and benefits in such a way that the investment costs are split between them fairly.

Freiburg, only two in five German firms still believe that RFID is fundamentally unsuited to their operations.

The multi-dimensional objectives of logistics providers (supplying additional value-added services while reducing costs) require that they link material, data and information flows more closely with one another. RFID makes a valuable contribution in this respect. Already today, for example, 1.3 million pallets of goods around the world are fitted with RFID tags every year.

In practical application RFID has so far proved its worth in the following five areas of logistics in particular:

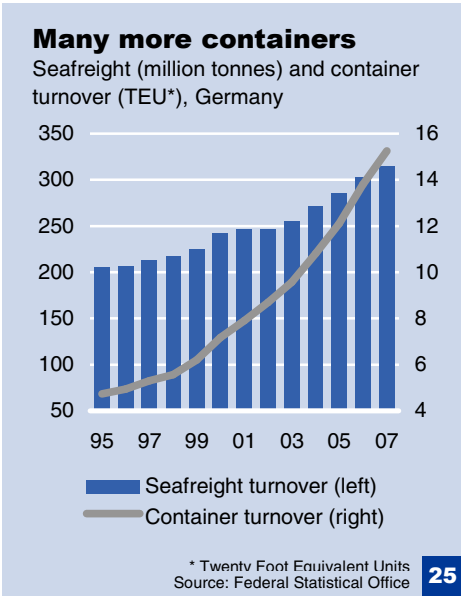
- Transport processing (e.g. transport documentation on one single medium),
- Warehousing (e.g. fast, error-free handover of goods),
- Inventory management (simple, rapid access),
- Ordering (automated documentation),
- Transport planning (flexible route planning).

The RFID projects take on the multi-dimensional responsibilities from the international value-added chain by concentrating especially on the following three partial aspects:

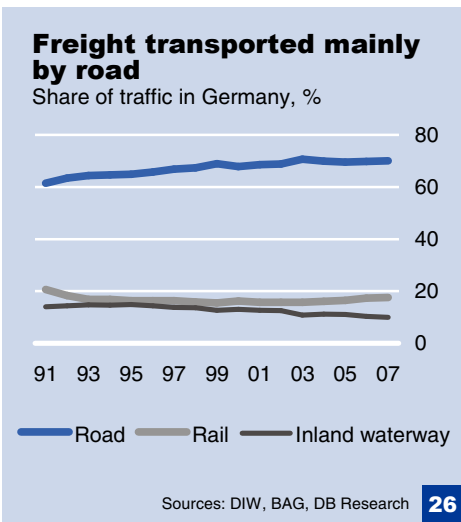
- Visualisation of physical goods flows (tracking and tracing),
- Automation of status information on the condition of goods (condition monitoring),
- Increase in transport safety and security (e.g. with hazardous goods) and increased support in liability matters (e.g. documentation of particular features of the transport).

The RFID projects illustrate that logistics providers on the three different stages of the supply chain can make gains. For example, for the transport and handling of large units (containers, bulk cargo) the efficiency of turning over the freight at the appointed place and time are the main points in focus. In this case, RFID projects are comparatively inexpensive since they are units mainly in closed-loop processes with reusable RFID chips. By contrast, with shipments of medium-sized units such as pallets and cartons smooth transfers in open-loop processes between upstream and downstream partners are more prevalent. Finally, logistics providers who have specialised in courier and express parcel services and other small consignments are mainly interested in optimising their internal processes. At this stage, projects are only promising if the RFID chip is of low cost compared to the value of the goods marked or can be recycled in closed-loop processes.

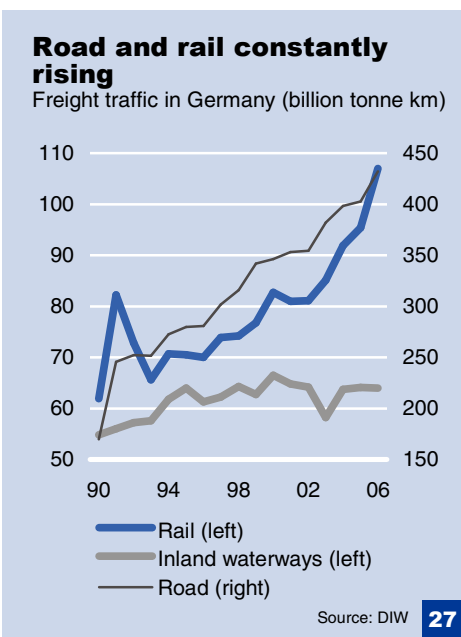
Despite the fundamentally positive outlook for all three of these segments, the projects show that RFID does not necessarily boost efficiency. Accordingly, McKinsey forecasts that, worldwide, 50% of pallets and one-third of transport packaging, but only 1 in 20 individual articles will be equipped with an RFID tag in 2010.



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4. Outlook: Hard times for now – long-term growth trends remain intact

The logistics sector is unlikely to escape the current downturn in the global economy. We expect nominal turnover to increase by about 2-3% p.a. on average over 2008 and 2009 with 2009 being worse than 2008. In real terms, this means stagnation at best. As the economy cools, the logistics and transport industries will find it increasingly difficult to utilise their capacities; this applies to existing load capacity in particular. Moreover, price hikes will be harder to push through than during an economic boom. Even before this, most companies were unable to pass on the increases in fuel costs to their customers in full or without a time lag. The bottom line is that the earnings situation – especially for the less complex logistics activities – will remain the big worry for the sector. Competition will remain fierce across the entire industry.

Railways might be able to increase their share of the modal split in the transport market in Germany. However, in Europe as a whole, the carriage of goods by road will probably grow more strongly for the time being as policymakers push for more road infrastructure in Eastern Europe in particular. In Germany, too, road transport will have to bear the brunt of the expected increase in goods traffic. The advantages in terms of flexibility and speed will remain in place. Furthermore, vehicle fuel efficiency will continue to increase. By contrast, inland shipping will probably further lose importance. Container shipping will remain the most rapidly expanding segment on the high seas. However, the supply of new ships is likely to outstrip demand until 2010. Air freight and short-haul maritime traffic should also stay on course for growth.

Growth drivers still in place

The long-term growth drivers of the logistics sector will remain in place. A slowing economy and a renewed rise in energy prices will not reverse the international division of labour. Nevertheless, nothing is about to reverse the globalisation process. While greater importance will be attached to transport costs in the choice of business location in future, low wage costs and the penetration of new markets will ultimately remain the weightier arguments. Moreover, there is still considerable latent potential for boosting energy efficiency in the transport industry. Two examples of what can be optimised are the speed of transports (in the near term) and new types of drivetrain (in the medium term). New technologies such as RFID can help in boosting efficiency in the industry. Risks to the globalisation process are more likely to stem from a reintroduction of politically motivated trade barriers than from high fuel prices.

There is no denying that the consolidation process in the industry is marching on. Cooperative ventures, company takeovers and insolvencies continue to leave an imprint on the SME segment of the goods transport sector. This development is reinforced by the fact that customers increasingly desire comprehensive offers from a single source and not just transport services from A to B. This benefits larger companies since they have the management and financial capacities as well as the technological prerequisites to satisfy their customers' sophisticated demands.

All the same, many interesting fields of activity will continue to attract small and medium-sized companies also in future. These include customer-tailored niche solutions (such as heavy transports, hazardous goods transports) or transport with a specific regional focus. As subcontractors and pure-play freight forwarders, micro-

companies will play a key role also in the years ahead. In this field, though, price competition will be particularly tough.

All things considered, we expect the overall logistics sector in Germany to post average nominal revenue growth of about 5% p.a. up to 2015. In a few segments, such as contract logistics, the growth performance could be significantly higher, possibly reaching the low double digits.

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