

## Eastern Germany's Transportation System:

### Can it Compete in Europe 1992 ?

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#### *Summary*

*The eastern German rail system is operating with one half the line network of western Germany, but approximately the same number of employees and amount of freight carriage. The two rail systems are proportionately about the same size (Railway Lines to Area Ratio). The eastern German road network proportionately is much smaller than the western (Main Roads to Area Ratio), but transports 83% as much freight as western Germany. The inland waterway system in eastern Germany is proportionately somewhat larger than western Germany (Waterways to Area Ratio), and transports approx. the same amount of freight. In every east German modal system a substandard infrastructure handles a disproportionate amount of freight compared to the west. This indicates that Eastern Germany could be extremely efficient with a modern, state-of-the-art transportation infrastructure.*

#### **Abstract**

This paper uses the Porter Diamond of National Competitive Advantage to evaluate the competitive condition of eastern Germany's Modal Transport Industries vis-a-vis the European Community in 1992 and Eastern Europe. A detailed analysis is provided for the Rail Freight Industry; while summary analyses are performed for the Shipping, Trucking, Air, and Intermodal Freight Industries. Overall, the Rail and Shipping Freight Industries are shown to hold promise for the development of independent, competitive market share positions within eastern Germany. The Trucking, Air and Intermodal Industry outlooks are described as poor in terms of their ability to achieve an independent competitive status. Specific recommendations are provided for the development and marketing of each modal freight industry. In particular, emphasis is placed on investment in infrastructure as the main factor condition prohibiting the development of competitive national freight industries. The conclusion recommends a reevaluation of the German government's infrastructural investment strategy whereby initial emphasis is given to the road network. The potential exists for a number of the other modal networks to develop high-tech facilities as a competitive weapon

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against the European Community in 1992. Eastern Germany should develop an investment strategy to take advantage of its potential as a liaison between the European Community and Eastern Europe.

### **Introduction**

One year after the fall of the East German communist regime, and two years prior to the official implementation of the European Community in 1992, Germany has become a field experiment in social, economic, and political restructuring. The results of German efforts will prove significant for Eastern European countries developing a strategy for eventual entrance into the European Common Market. They also will be pertinent for other Western European countries considering significant capital investments to improve overall competitiveness within European and global markets. The question is, what are the developmental requirements of the new eastern Germany and how should the government allocate its limited resources among them? Furthermore, what can other countries learn from the German experience? In order to answer these questions in the context of international competition, the Porter Diamond of National Competitive Advantage is used to analyze the current condition of, and potential for, the major national transport industries.

### **Background**

Eastern Germany is a land of many and diverse strengths for Industrial development. The recent reunification with West Germany lends a high degree of political clout, stability, and economic resources to the restructuring efforts, a strength that no other Eastern European countries are fortunate enough to have. East Germany maintained a strong educational, R&D and apprenticeship system after the war, inspired by and modeled after the West German systems. A black market thrived within the centrally planned economy, serving to foster a latent entrepreneurial spirit that may resurface over the next several years. A marketing paradise, the nation has very strong consumer demand with few developed corporate or brand loyalties. Eastern Germany has a long history of industrialization, and thus is one of the most highly developed Eastern-bloc countries. Finally, for the short term only, eastern German wages are much lower and more attractive than those of western Germany. This should serve to attract new business eager to capture the Eastern-bloc markets, but reluctant to set up in their politically unstable countries.

Despite these strengths, Germany currently faces a tremendous range of challenges. In addition to losing fifty percent of her domestic market, eastern Germany lost most Eastern-bloc orders upon reunification due to the lack of

hard currency held by customers (13). Fully 25% of the 8,000 state-owned eastern German firms are currently bankrupt (23)(25), and unemployment is expected to rise to over 30% (25). Labor conflicts loom in the horizon as former state-owned firms streamline operations to become more attractive to western buyers. Transportation and telecommunications infrastructure is in severe disrepair. Five new Länder states are being financed from scratch (15) through reunification: on top of projected government expenditures of \$600B (25); at least \$675B will be required in private investment through the year 2000 (24).

A recent study by the Federal Reserve Bank of Boston indicates that government investment in infrastructure results in greater output, increased private investment and higher employment growth. The study suggested that public investment often precedes a general pickup in economic activity by serving as a base for future growth (20). In order to harness eastern German resources (see Exhibit One) for industrial development, the most immediate challenge that the government faces is the very poor condition of the transportation infrastructure (5)(26). West German investment in this sector of Eastern Germany began prior to reunification (6)(26) when the far-reaching effects of 45 years of neglect became clear.

Logistics, which depend heavily on transportation infrastructure, have increasingly been viewed as a potential source of national competitive advantage for a variety of industries (4). European Community directives, to be instituted by the end of 1992, are causing a 25% drop in German intra-European transport tariff rates (2) and a corresponding increase in direct transport industry competition. This means that eastern Germany has limited time to devise an investment strategy that will ensure the development of a competitive national transport industry and a sound industrial base. The point is that, while the rest of the European Community has an adequate transportation network after significant capital expenditure following WWII, the eastern German network must be completely rebuilt as if from scratch. The potential exists for the government to create a state-of-the-art logistical system that far exceeds current European standards and is capable of propelling eastern Germany into the forefront of transport service and technology.

This analysis uses the Porter Diamond of National Competitive Advantage to illustrate the current condition of eastern Germany's transport networks, compare the strengths and weaknesses of each transport industry, and to identify infrastructure as an important area for the development of viable national transport industries. The model was developed by Porter as a tool for government and industry leaders to assess areas of competitive advantage and disadvantage within national industry. An underlying assumption of the model asserts that national industry operates in an environment with four basic attributes established by a nation, including: *Firm Strategy, Structure and Rivalry*; *Factor Conditions*; *Demand Conditions*; and *Related and Supporting Industry* (22). *Firm Strategy, Structure and Rivalry* are "the conditions in the

nation governing how companies are created, organized, and managed, as well as the nature of domestic rivalry". *Factor Conditions* are "the nation's position in factors of production, such as skilled labor or infrastructure, necessary to compete in a given industry". *Demand Conditions* are "the nature of home-market demand for the industry's product or service". *Related and Supporting Industries* are defined as "the presence or absence in the nation of supplier industries and other related industries that are internationally competitive" (22). These attributes will now be used to categorize the five different modal transport systems in eastern Germany. The Rail Freight Industry is evaluated in full detail (see Exhibit Two); the Waterway, Trucking, Air, and Intermodal Freight Industries are evaluated in summary form (see Exhibit Three).

## **Rail Freight Industry**

### *Industry Structure, Strategy, Rivalry*

The Deutsche Reichsbahn now technically shares the German rail freight market with the western Bundesbahn; although at present, the firms maintain separate legal identities. Both rail systems are currently owned and operated by a government agency which strives for synergy and cooperation. There is some debate surrounding this arrangement, however, as many argue that the two firms would benefit more from direct competition. With the Reichsbahn losing at least DM 170M per year (29), there has been some talk of privatization. The Reichsbahn rail network is one half the size of the Bundesbahn network, but hauls approximately the same freight tonnage, estimated at 59B tonne-kilometers per year (See Exhibit One). The two rail networks employ approximately the same number of workers (12). The amount of competition that will develop between these two systems is a function of the ownership of the companies and the ownership of the rail infrastructure. Two scenarios seem likely: first, the government could maintain ownership of the rail networks and companies, as is traditionally the case within the rail industry, in which case significant competition for the rail freight market is unlikely to develop; or second, the government could maintain ownership of the rail networks, but privatize one or both of the rail companies, in which case competition would be expected to develop. In the first scenario, the government would be wise to immediately invest in the rail system infrastructure in order to enable the Reichsbahn to operate efficiently, thus encouraging the establishment of a competitive industrial base in the east. In the second scenario, the privatized companies would be expected to fund the development of the infrastructure through usage taxes; however, some up-front investment would be necessary to establish the Reichsbahn as an efficient national player.

*Factor Conditions*

The Reichsbahn rail network is in very poor condition. No attempt was made to electrify train routes until the early 1980s, thus only 14% of the rail lines are currently electrified (9)(10). Electrification is supposed to help ease environmental concerns and improve efficiency; however, the brown coal power plant which supplies current to the lines leaves a residue of sooty ash negating any environmental benefits of electric power (8). Over 30% of the rails are single track where the Soviets used one set of tracks to dismantle the other set for shipment back to the Soviet Union (21). Fifteen million railway ties are in complete ruin because the cement used to set them was mixed using high-alkaline Baltic sand, causing the ties to degrade within four years of placement (8)(29). Estimates indicate that five years (8) and DM 100B are needed to improve the track network (21). Until this investment is made, the tracks will not be able to support increased tonnage - the system is currently running at full capacity (8). In the meantime, horror stories abound: one 12 kilometer freight journey required sixteen hours travel; one 950 kilometer section of rail contains 1,000 different speed limits; 1987 figures reveal the occurrence of 9,200 breakages in railroad tracks, 9,800 signal/block errors and 890 electrical problems with overhead lines (8). The rail network has some positive attributes, however. The Reichsbahn runs on the same track gage as Western Europe, although it is a narrower gage than that of the Soviet Union (16). Shunting yards for shifting tracks are presently available in Wustermark, Magdeburg-Buckau, Guestrow, and Bad Kleinen (15). Current freight train routes into western Germany include those running from Berlin to Hamburg, Hannover, Frankfurt, and Munich (57). These important routes are part of a relatively dense rail network that provides broad access to all major industrial areas.

Eastern rail freight equipment is also in severe disrepair. The Reichsbahn network owns very few containers or cranes. Most freight continues to be loaded manually, but one half of the forklifts in eastern Germany are likely to be broken at any one time (8). An estimated DM 30B is needed to improve the rolling stock equipment (23), most of which is fully depreciated and at least 45 years old (8). Management has currently reintroduced the old Reichsbahn trains between Berlin and Hamburg; due to both the rickety rail system and the antiquated engines, these 45 year old trains cover the 209 kilometer distance at 70 km per hour (29) compared to typical European trains running at 145 km per hour (14). Double-stacking of containers, or piggybacking, is currently impossible because the tunnels need to be widened and the bridges must be raised (7)(8). Almost half of the 8,200 train bridges are older than 85 years and have never had significant repairs. In addition, approximately two-thirds of the train crossings were constructed prior to 1945 and will need attention as roads are improved (8).

Labor relations and telecommunications are extremely important to the maintenance of a strong competitive position in logistics (2). Customers demand increased flexibility, speed, and dependability. Freight turnaround

time has become increasingly important and necessitates swift loading and unloading at ports, and data linkages throughout the entire value chain. Unfortunately, the eastern German economy will not be conducive to strong labor relations anytime in the near future. There exists significant historical precedence for labor problems. Prior to reunification, West German rolling stock was often idled as workers failed to show up for loadings and unloadings (28). Rail employees have traditionally been civil servants; the recent strike activity in the Reichsbahn system is likely to presage further unease as the company attempts to streamline operations and reduce its laborforce. These labor issues, combined with the lack of a basic telecommunications infrastructure (1) will pose serious problems for maintaining a flexible, dependable rail freight system.

### *Demand Conditions*

Road congestion is becoming a very significant problem in eastern Germany (8). Many residents used their savings upon reunification to purchase western automobiles. Tourism is steadily increasing and people are travelling to eastern Germany to scout for family connections and business opportunity. Couple this increased traffic with the perpetual road repairs and skyrocketing number of accidents; and there emerges a strong potential market for rail freight as an attractive alternative to trucking. Many analysts are calling for the government to encourage rail freight transport in order to alleviate road traffic problems (19), yet current investment plans call for road network repairs before significant rail network repairs. This strategy will severely impact the Reichsbahn's ability to effectively service developing industry freight requirements.

The emergence of high speed rail networks across Europe will also have an important effect upon the rail freight industry. The growth in high speed rail is being driven by the manufacturing industry's demand for quicker, more flexible delivery scheduling to accompany new Just-in-Time (JIT), Material Requirements Planning (MRP), Flexible Manufacturing Systems (FMS) and Computer Integrated Manufacturing (CIM) techniques. The Reichsbahn absolutely cannot support this type of service. With the government's current emphasis on road over rail repair, it seems likely that a high speed rail network will not be constructed in eastern Germany at least until the year 2000. One notable exception to this is a high-speed rail planned to link Hannover and Berlin reducing the current 4 hour trip to 1 1/2 hours at 400 kilometers per hour (8)(9).

Historically, the East German government maintained energy-saving policies which required any freight travelling over 50 kilometers to be transported by train (9)(17)(18)(21). Rail freight typically was utilized to reduce costs, conserve energy and preserve the natural environment (11). However, these policies meant that long, slow, circuitous rail movements were necessary to carry freight short point-to-point distances (18), and therefore served only to perpetuate the inefficiency of the Reichsbahn. With

Europe 1992 looming ever closer, the rail freight industry has limited time to reverse the negative effects of these policies. Typically, rail freight has been utilized predominantly by captive industries including extracting, heavy machinery and agricultural industries. Eastern Germany is fairly strong in these industries (see Exhibit One), so there may be a trend towards the continued use of the rail network for long distance transport. On the other hand, there has been a general trend in western Germany towards the gradual decline in rail transport as a proportion of total freight transport (11). In fact, several EC laws work to give trucking a distinct advantage over rail transport (8). As west German business moves into the east, it is possible that eastern freight transport will shift toward a similar pattern. However, given the captive industry and severe traffic problems in the east, a moderate level of demand will likely remain for rail freight service.

#### *Related and Supporting Industries*

The rail freight industry in eastern Germany will be largely affected by the high speed trains, intermodalism, and increased competition from trucking. As mentioned above, high speed trains are not likely to be an immediate opportunity due to the poor condition of the rail infrastructure. In addition to the huge investments required, there are safety and environmental concerns about high speed rail networks cutting through some very densely populated industrial areas. Intermodalism is a much more immediate opportunity (2)(3). Investment in the telecommunications infrastructure will be imperative for this alternative to become viable. There is significant pressure to adapt to the evolving needs of the shipper. If eastern Germany cannot support the data networking needs of large intermodal firms, the current state-owned, bulky transport firms are unlikely to capture significant subcontracting business from them. The trucking industry presents a very immediate threat as a substitute form of transportation for non-captive industry (2).

#### *Overall Evaluation and Specific Recommendations*

Utilizing Porters' model, the overall outlook is promising for the future of the Reichsbahn given appropriate investment in the rail infrastructure. *Industry Structure, Strategy and Rivalry* indicates a possible competitive advantage for Germany over other EC nations because of the potential for beneficial competitive or synergistic relationships between the two firms. Analysis of the *Factor Conditions* illustrates a critical need for heavy investment in the rail network to produce a state-of-the-art rail infrastructure. The Reichsbahn has an important opportunity to leapfrog the Bundesbahn by building an ultra-modern rail network with supporting facilities including complete linkage with roads, ports, airports and major industrial cities. However, the rail network is in such poor condition that immediate infrastructural attention is critical to the development of this industry's potential. The government

should reconsider its investment strategy to allow for some rail improvements prior to the completion of road construction. *Demand Conditions* indicate mixed trends, but the negatives could be easily overridden given a shift in government policy. *Related and Supporting industries* will have a neutral impact on the Reichsbahn because of their parallel dependence on the transportation and communication infrastructures. After the development of a sophisticated infrastructure, the Reichsbahn should develop and promote flexibility for industrial freight business and market its ability to alleviate road traffic congestion problems.

### Other Modal Industry Analysis

The overall prognosis for the Waterway Freight Industry is promising. Although in Europe the industry is faced with fierce competition and overcapacity, most of the eastern German companies are participating in international joint ventures to gain technology, management expertise, and new international market exposure. The waterway system is not as underdeveloped as other modal transport systems; the most pressing investment requirement is for container support equipment. Demand conditions are mixed; the negatives offer little that strenuous marketing efforts couldn't resolve. Related industries are threatening, but the potential for damage is limited by the infrastructural problems that each of the challenging industries face and the limited competition allowed by EEC restrictions. The industry can develop and operate at a substandard level prior to the necessary investment in infrastructure.

Trucking does not show promise for the development of a national industry. East Germany's old trucking kombinat, Deutrans, is being privatized and is entering into a number of alliances and joint ventures with large, international trucking firms. Very small trucking companies may be able to survive in small niche subcontracting markets. But the large number of foreign entrants, combined with the shortage of modern equipment and a devastated road infrastructure, is likely to discourage the development of new large or medium-sized eastern German firms. The fact that foreign and western German firms will dominate the trucking industry in the east, and fund development through road usage taxes, should discourage huge direct government investment in the road infrastructure. Direct government expenditure would serve only to strengthen non-national trucking's competitive advantage in eastern Germany. Attention should instead be focused on networks that show more potential for the development of a national industrial competitive advantage, i.e. rail and waterway freight. Demand conditions for trucking are mixed; huge overcapacity is expected to develop in Europe after 1992, but trucking has traditionally been the staple mode of transport for freight in Germany. With the opening up of Eastern European consumer goods markets, the overcapacity expected for trucking in Europe may not be as



much a problem as was originally anticipated. The Trucking Freight Industry does, however, face serious threats from several related industries. Altogether, this modal industry requires significant road network investment, through a combination of governmental and private funding, to become a viable and internationally competitive mode of freight transport.

The Air Freight industry has not survived as an eastern German-based industry. ~~The government was unable to locate a buyer for the main airline, Interflug, before the firm went completely bankrupt.~~ Factor conditions are mixed: infrastructure capacity is widely available, but in severe disrepair. Demand conditions are not promising; not only is the safety of Interflug's remaining equipment questionable, but air freight transport has traditionally been underutilized by industry due to high cost. However, the trend toward flexibility and time-based competition in global manufacturing will encourage higher air freight usage with the new Berlin airport positioned as the eastern-most hub in Europe. Unfortunately, the development of a number of related and competing industries will threaten this potential advantage. Any new airline in Eastern Germany will need to invest heavily in commercial support infrastructure and market itself as a flexible, high-quality mode of transport providing service to Eastern Europe.

The prognosis for Other Freight Industries, given current German Investment projections, is very poor over the next ten to twenty years. The primary focus of this analysis was on the intermodal Transport Industry. National industry is unlikely to develop due to the number of large, foreign firms entering the market with massive international resources at their disposal. Even given these resources, foreign firms will have difficulty providing traditional levels of service when faced with the extremely poor conditions of all of the major modal transport infrastructures. These international intermodal carriers promise many services that cater to new manufacturing trends, and are likely to subcontract significant business to the separate modal industries once they have become established. The government's attention to this market, therefore, will be extremely important to the development of national modal industries - even though new intermodal conglomerates are unlikely to emerge. It is thus important for investment to ensure that state-of-the-art intermodal connections are constructed within the infrastructure to support this powerful industry.

### Conclusion

This paper attempts, using the Porter Diamond of National Competitive Advantage, to evaluate the current competitive position of the eastern German modal transport industries. Specifically, the condition of the transportation infrastructure was emphasized as a determining factor of development potential for national transport industries. The analysis of factor conditions within these modal industries, taken together, clearly indicate the

critical and primary need for transportation network investment. Although investment in the trucking infrastructure is very important to the development of an industrial base in eastern Germany, the decision of the German government to focus on the road network before any other transport network will have serious repercussions on modal industries that perhaps show more national promise than trucking industry (i.e. Rail and Waterway Freight). Intermodal transportation is quickly becoming the industry of the future as it successfully addresses the needs of flexible manufacturing systems. This industry depends heavily on all of the major transport networks. The German government should reevaluate its investment plans to consider a systematic development plan for all of the modal networks together, with special emphasis on transport systems that can provide a local return on investment. In some cases, this will improve the chances for national modal industries, such as the Waterway Freight Industry, to develop. In other cases, it will serve to encourage the establishment of an industrial base within eastern Germany. All of the modal industries have an important opportunity to develop state-of-the-art facilities from scratch to gain a comparative advantage for eastern Germany over other European industrialized countries. Although this would require huge capital outlays upfront, the payoff could be immense as eastern Germany is, both literally and figuratively, the closest EC member to Eastern European markets.

The usage of Porter's Diamond of National Competitive Advantage for the analysis of national transportation systems is somewhat problematic. The model is designed to deal with industries that experience normal competitive pressures and operate within a well-defined industry structure. Transportation industries present a unique problem because they are often nationalized and highly regulated; they play a special role in national security concerns. This special relationship with the government means that environmental factors such as economic and political stability, financial policy, defense priorities, and cultural norms become important. These environmental factors do not readily manifest themselves within the Porter framework as key strategic considerations. The Porter model has further limitations because it is static in nature. This becomes particularly apparent when evaluating Eastern-bloc countries where events are unfolding rapidly, as drastic transformations in public and private sector policy has become a daily event. Transportation systems would seem to require an analytical model that accounts for competition as a function of firm and infrastructural ownership, and adjusts strategic perspective accordingly.

MODAL DATA*	METRIC	EASTERN GERMANY	WESTERN GERMANY
GNP (1988)	\$ Billions	207.20	1,120.00
Geographical Area (Area)	Sq.km	108,177.00	248,667.00
Population	Thousands	16,300.00	63,200.00
Workforce	Thousands	8,960.00	27,790.00
Railway Lines	km	14,232.00	27,400.00
of which Electrified	km	1,934.00	11,500.00
Number of Employees	People	238,000.00	251,000.00
Railway Lines to Area Ratio	km/Sq. km	0.13	0.11
Railway Freight	Bill.Tonnes/km	59.00	58.40
Main Roads	km	47,461.00	409,000.00
Motorways	km	1,818.00	8,600.00
Main Roads to Area Ratio	km/Sq.km	0.44	1.64
Road Heulage	Bill.Tonnes/km	118.80	143.30
Inland Waterways & Canals	km	2,885.00	4,330.00
Waterways to Area Ratio	km/Sq.km	0.03	0.02
Inland Shipping Freight	Bill.Tonnes/km	49.40	47.70
Airways	km	120,523.00	?
Air Trafic. Freight	Bill.Tonnes/km	1,802.00	4.40
Major Exports		Machinery, Equipment Chemicals, Steel	Machinery & Tools Chemicals, Iron, Steel
Major Imports		Precision Engineering Raw Materials, Fuels	Motor Vehicles Raw Materials, Fuels
Major Trading Partners		Agricultural, Mach'y USSR, Eastern-Bloc Western Germany	Mind & Agric. Products France, Netherlands Benclux, UK, US, Italy

Exhibit 1: Comparison between East and West Germany

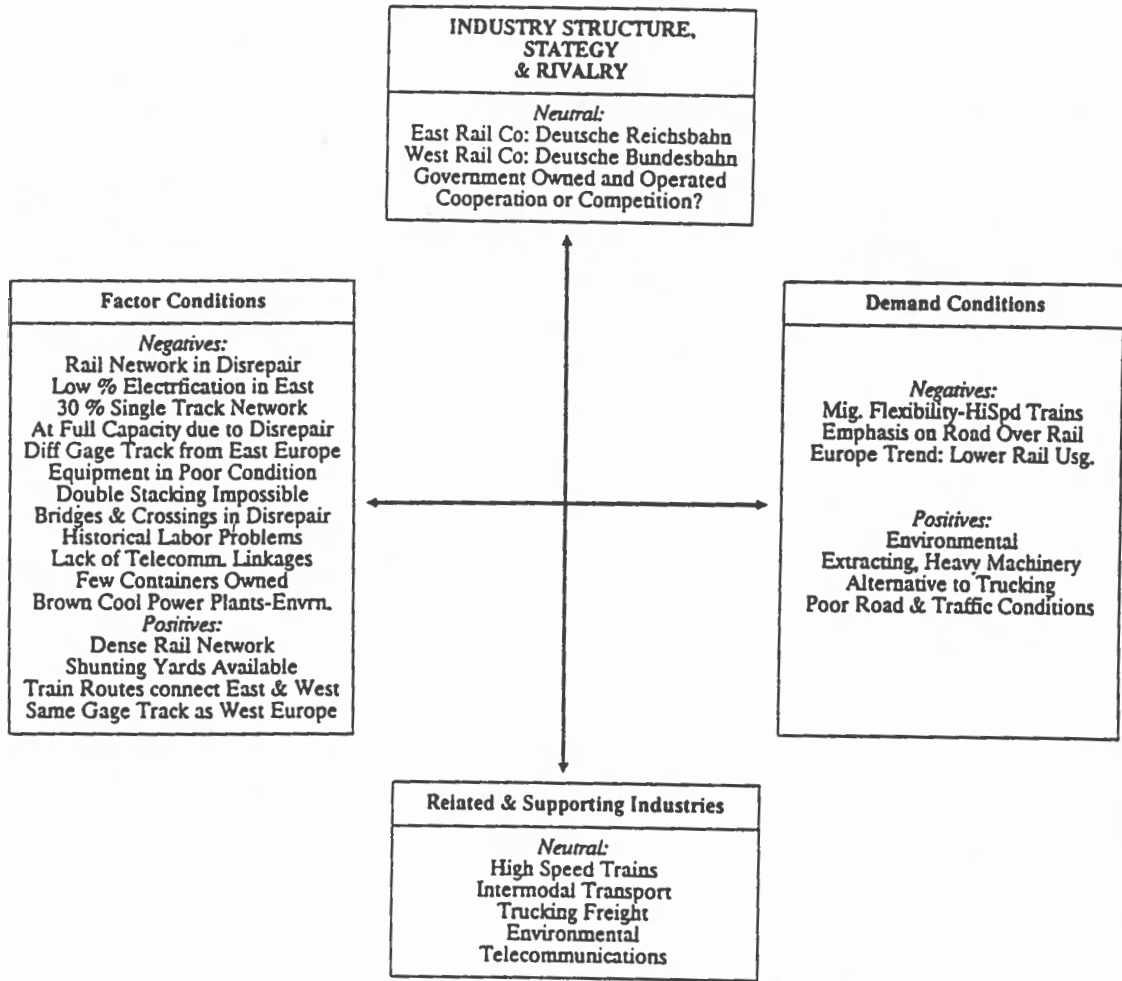


Exhibit 2: Porter analysis of rail freight industries

PORTER MODEL FACTORS	WATERWAY FREIGHT INDUSTRY	TRUCKING FREIGHT INDUSTRY	AIR FREIGHT INDUSTRY	OTHER FREIGHT INDUSTRIES
<p><b>INDUSTRY STRUCTURE, STRATEGY, RIVALRY</b></p>	<p><i>Neutral:</i> Deep Sea Operators Short Sea Operators Inland Waterway Ops.</p> <p><i>Negative:</i> Fierce Competition Overcapacity</p> <p><i>Positive:</i> Int'l Joint Ventures</p>	<p><i>Neutral:</i> Deutrans-major co. Franchise Links of Sm.Co.</p> <p><i>Negative:</i> Alliances &amp; JVs Some Cos. starting fresh Exclusive Contract Rel. Many foreign entrants Industry Shakedown European Overcapacity Price Wars Likely</p>	<p><i>Neutral:</i> Interflug-major co.</p> <p><i>Negative:</i> Lufthansa - competitor Interflug Bankrupt Foreign Firms Bidding Price Wars Likely</p> <p><i>Positive:</i> Privatization Cartel Concerns</p>	<p><i>Neutral:</i> Pipelines Cour far Service Overnight Parcel Delivery Intermodal Transport Master Freight Consol</p> <p><i>Negative:</i> Large Int'l Companies Shakedowns Expected Deregulation</p>
<p><b>FACTOR CONDITIONS</b></p>	<p><i>Negative:</i> Strong Union industry Restrictive Labor Agmts Break-Bulk Cargo used Limited Canal Network</p> <p><i>Positive:</i> Three Baltic Seaports Rostock Dominates Int'l Shipping Routes Canal/River Network Lock Systems in Place Canal link East &amp; W. Telecomm. Linkage Plnd.</p>	<p><i>Negative:</i> Road Network in Disrepair Cobblestone &amp; Gravel Main Roads North-South Few HWays Connect Cities Low Speed Limits Scarcity of Service Statns Oil Contaminated Grounds Severe Traffic Congestion High Accident Rates Driver Habits Differ E&amp;W Old &amp; Substandard Trucks Support Equipment Scarce Road Bridges Unsafe Info. Systems Needed</p>	<p><i>Negative:</i> Schönefeld in disrepair Tegel at Full Capacity Few Linkages Between Inexp'd Controllers Air Corridors Restricted Substd. Soviet Aircraft Old Air Trfc. Cntrl. Eqp.</p> <p><i>Positive:</i> Schönefeld &amp; Tegel New Airport Planned Leipzig &amp; Erfurt Airpts of Military Airports AMADEUS Connect. Plnd.</p>	<p><i>Negative:</i> Airports: Full Capacity Rail Network in Disrepair Road Network in Disrepair Seaports in Disrepair Real Estate Unreliable Economic Instability Labor Unrest Poor Information Sys.</p>

Exhibit 3a: Porter analysis of other modal freight industries

PORTER MODEL FACTORS	WATERWAY FREIGHT INDUSTRY	TRUCKING FREIGHT INDUSTRY	AIR FREIGHT INDUSTRY	OTHER FREIGHT INDUSTRIES
<b>DEMAND CONDITIONS</b>	<p><i>Negative:</i> Very slow mode Trad. Low Demand in E. Reqs. Add'l Land Movem.</p> <p><i>Positive:</i> Inexpensive mode Trad'l industries match Very large shipments</p>	<p><i>Negative:</i> Demand &lt; Supply expected Environmental Restricts</p> <p><i>Positive:</i> Small Firms - niche mkts. 80% share intre-EC trade Huge Mkt for Consumer Gds. Focus on Road Repair First</p>	<p><i>Negative:</i> Mostly Emergency Use Quick but Expensive Safety &amp; Noise Concerns</p> <p><i>Positive:</i> Mfg. Trend -Flexibility Quality, Damage Free Deliv. Eastern - most Hub?</p>	<p><i>Positive:</i> Few Size/Wt. Restricts Single Carrier Reliabl. Door-to-Door Service Vertical Integration Suppl. Mfg. Flexibility</p>
<b>RELATED SUPPORTING INDUSTRIES</b>	<p><i>Negative:</i> Intermodal Transport Rail Network Mediterranean Ports Freight Forwarders Rotterdam dominates EEC restrictions</p>	<p><i>Negative:</i> Private Trucking Fleets Specialized Carriers Rail Threatens Short Term Environmental Movement Service Stations but EEC favors Trucking</p>	<p><i>Negative:</i> Intermodal Transport Postal Monopolies Fax Machines High Speed Trains</p>	<p><i>Neutral:</i> Rail Freight Waterway Freight Trucking Freight Air Freight Public Works</p>
<b>OVERALL EVALUATION</b>	Promising for Development of E. German Cos.	Poor Outlook for E. German Cos. LT OK for Sm.Niches	Poor Outlook without Merger or Takeover	Poor Outlook for next Ten - Twenty Years
<b>SPECIFIC RECOMMENDATIONS</b>	Dredge & Widen Canals Modernize Inland Ports Devise Port Strategies Determine Scope of Svc. Adapt. Containerization Improve Port Facilities Obtain icebreakers Connect to rails & roads VI for door to door srvc	Obtain Modern Fleet fr EEC Develop Niche Markets Pursue Jvs and alliances Small Cos. must Subcontrl Overhaul Road Network Driver Training Programs Install Communications Innovation is key Develop Strategic Plans	Concentrate on Freight Upgrade Equipment Market "Eastern-most" Retrain E.Germ Pilots Market "Flexibility" Market "Quality" Resolve Safety Issues Cnct Arpts - HiSpd Trn Provide Door-Door Svc.	Improve Infrastructure Capital Investments Achieve Econ. Stability Encourg. Forgn. Invest. install Info. Systems Develop Strategy Market "Value-Added" Market "Premium Svc"

Exhibit 3b: Porter analysis of other modal freight industries

## NOTE

I would like to thank Professor Edwin Murray and Professor Peter Arnold of Boston University for their assistance with this paper.

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## Ostdeutsche Transportsysteme: Sind sie im Europäischen Binnenmarkt konkurrenzfähig?

### Zusammenfassung

*In dem vorliegenden Artikel werden die Transportsysteme Ostdeutschlands mit denen Westdeutschlands verglichen. Dabei zeigen sich beispielsweise beim Schienenverkehr große Unterschiede. Das in Ostdeutschland vorhandene Schienennetz umfaßt quantitativ zwar nur die Hälfte dessen in Westdeutschland, die Transportmengen und die Anzahl der Beschäftigten im Bahnverkehr sind jedoch die gleichen. Beim Vergleich des Straßennetzes fällt auf, daß das ostdeutsche Straßennetz erheblich kleiner ist als das westdeutsche. Das Transportaufkommen beträgt jedoch 83% von dem in Westdeutschland. Neben Schienen- und Straßennetz werden außerdem Transporte auf den inländischen Wasserwegen verglichen.*