

**FREIGHT AND THE ENVIRONMENT: EFFECTS OF TRADE LIBERALISATION
AND TRANSPORT SECTOR REFORMS**

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TABLE OF CONTENTS

ENVIRONMENTAL EFFECTS OF CHANGES IN INTERNATIONAL FREIGHT MOVEMENTS ASSOCIATED WITH TRADE LIBERALISATION AND STRUCTURAL REFORM IN THE TRANSPORT SECTOR: SYNTHESIS REPORT	4
I. Background	4
II. Environmental Effects of Freight	5
III. Simulation of Uruguay Round commitments on trade liberalisation and international freight movements in 2004	7
IV. Liberalisation/structural reform in the transport sector	8
A. The North American experience	8
B. The European experience	10
V. Concluding remarks	12
REFERENCES	14

Tables

Table 1. Air Emission Factor Ranges for Truck, Rail, and Marine, in grams/tonne-km.....	5
Table 2. Comparison of the average external environmental and accident costs of road and rail transport (1991 ECU per 1 000 tonne-km).....	6

ENVIRONMENTAL EFFECTS OF CHANGES IN INTERNATIONAL FREIGHT MOVEMENTS ASSOCIATED WITH TRADE LIBERALISATION AND STRUCTURAL REFORM IN THE TRANSPORT SECTOR: SYNTHESIS REPORT

I. Background

In early 1996, the OECD Environment Ministers concluded that measures were needed to offset the environmental effects arising from changes in international freight movements. They agreed:

- on the need for effective measures to avoid the unwelcome consequences of ever increasing demand for road transport;
- that measures to reduce and internalise the environmental costs of all kinds of transport, including the removal of subsidies and tax disincentives to environmentally sustainable transport were vital; as were
- measures to encourage a shift in demand away from cars and trucks towards less environmentally damaging modes such as bus, rail, waterways and non-motorised transport.

Transport is generally recognised as a problem sector for its many and varied effects on the environment. Attention has been increasingly focused on goods movements as freight activities have been growing in tandem with gross domestic product (GDP) and generally more quickly than passenger traffic. Closer economic integration and the strong movement towards liberalisation of economies, including the reduction of barriers to trade, have all had implications for the transborder flows of goods. A review by the European Conference of Ministers of Transport (ECMT), *International Traffic Trends*, underscores the fact that international freight movements are the most dynamic element in overall growth of freight in Europe, due to the growing importance of the periphery -- the newer Members of the European Union (EU); the associated members in the Mediterranean and central and eastern Europe; and the southern European States. And there is concern in some quarters that the greater exchange of goods that accompanies the economic growth gained from trade liberalisation and liberalisation in the transport sector will contribute to increased environmental damage.

In September 1995, the Joint Session of Trade and Environment Experts decided to undertake a study examining the environmental effects of international transport of goods attributable to trade liberalisation and liberalisation/structural reform in the transport sector itself. The study looked at to what extent trade liberalisation is contributing to increased pressure on the environment from the growth in transport and at two questions in particular: (a) are changed movements in international freight associated with trade liberalisation are a significant factor in this calculus; and (b) have the reforms undertaken to date towards freer access and increased competition contributed to greater pressure on the environment through negative scale effects or have the economic efficiencies they have engendered also been associated with positive environmental efficiencies.

The various components of the Joint Session transport sector study investigating the liberalisation/freight/environment nexus are summarised below. Following this introduction, a brief overview in Part II describes the environmental effects of freight. Part III brings out the principal findings of a modelling exercise simulating the changes in the intercontinental freight movements associated with Uruguay Round commitments. As a point of reference, projections of increased freight movements associated with overall macro-economic growth are summarised. Liberalisation or structural reform of the transport sector itself was determined to be an essential factor in understanding the links between economic and environmental efficiencies. The first section of Part IV summarises the experience of North America, and particularly the United States, with respect to the liberalisation of the transport sector since 1980 as well as implications of the North American Free Trade Agreement (NAFTA) for freight movements. In the second section, the European experience with liberalisation of various freight transport modes is discussed as well as their implications for the shift in modal split. A final section, Part V, makes a few concluding remarks.

II. Environmental Effects of Freight

A Joint Session study (OECD, 1997a) described the environmental impacts in qualitative terms. It then provided both physical emission factors per unit of freight transported and estimates of the marginal social cost of some of the impacts, as available in the current literature. Structured by transport mode, the review addresses shipping, air cargo, trucking, rail, pipelines and intermodal terminals. Transport affects the environment through the mechanisms of air pollution, global climate concerns, noise, water pollution, accidents, land use and habitat fragmentation. The modal discussions focus on air pollution, global climate issues, water pollution, accidents whose costs are environmental rather than primarily in human life, and certain land-use planning issues.

Some clear conclusions can be drawn by comparing the data presented. Data on air pollution permit the most straightforward comparison. Despite substantial variation among the estimates within each transport mode, trucks are clearly much more polluting than trains or ships. This applies across all pollutants (CO, CO₂, HC, NO_x, SO₂, particulates and VOC) as detailed in the table below. The data suggest that rail may be more harmful than marine transport, however, this is much less clear. The use of different methodologies to derive the emission factors may well be more significant than any possible generalisation about the differences between marine and rail transport based on these data.

Table 1. Air Emission Factor Ranges for Truck, Rail, and Marine, in grams/tonne-km

Pollutant	Truck	Rail	Marine
CO	0.25 - 2.40	0.02 - 0.15	0.018 - 0.20
CO ₂	127 - 451	41 - 102	30 - 40
HC	0.30 - 1.57	0.01 - 0.07	0.04 - 0.08
NO _x	1.85 - 5.65	0.20 - 1.01	0.26 - 0.58
SO ₂	0.10 - 0.43	0.07 - 0.18	0.02 - 0.05
Particulates	0.04 - 0.90	0.01 - 0.08	0.02 - 0.04
VOC	1.10	0.08	0.04 - 0.10

Source: OECD, 1997a, The Environmental Effects of Freight.

The available evidence is less clear with respect to noise pollution. Most evidence points to trucks being a more significant source of noise than other modes of freight transport. The noise nuisance posed by rail is generally considered to be less than that posed by trucks, largely because railway noise is intermittent, whereas highway noise (including trucks) tends to be fairly constant. However, the level of noise pollution created by an individual train passing is considered to be very little different from that of a truck.

As regards noise pollution, recent data suggest that the mid-point of the range of external environmental costs for road noise is twice as high as that for rail. In addition, comparison of the social costs of other external environmental impacts (see the table below) also indicates that the average external costs for road are higher than for rail.

Table 2. Comparison of the average external environmental and accident costs of road and rail transport (1991 ECU per 1 000 tonne-km)

External effect	Freight ^a ECU per 1 000 t km	
	Road	Rail
Accidents	7 - 11	0.75
Noise	3 - 7.5	1.8 - 3.5
Local pollution	2 - 8	0.6 - 2
Greenhouse effect	4	1
TOTAL	16 - 30	4 - 7.5
^a Provisional figures. <i>Source: ECMT, forthcoming.</i>		

Aircraft emissions are also of concern as although air cargo accounts for less than one per cent of world-wide freight it is growing rapidly. Moreover, with increasing concern about global warming, concern about aircraft emissions has grown. Noise, pollution, congestion and other land-use issues pose major problems around airports. However, establishing a link between these impacts and air cargo is difficult, especially as two-thirds of air freight is carried in passenger planes.

The other types of environmental harm caused by transportation are more difficult to evaluate, for example comparing the impacts of ocean freight with those of other modes of transportation. Although the most harm from shipping affects marine life rather than humans, damage to previously intact ocean ecosystems is a serious environmental issue. Similar problems arise in looking at nuisance species. While some of their harms can be quantified -- notably the infrastructure repair necessitated by the zebra mussels in the north American Great Lakes -- it is difficult to place a value on the disruption of marine ecosystems. While the impact of increased freight on these problems can be described, that impact cannot be easily compared with the threat posed by different modes of transport. The same kind of analytical difficulty applies to the issue of habitat fragmentation in critical areas and sensitive ecosystems. In a few cases, such as the construction of roads through the Amazon or the Alaska pipeline, the public has become aware of the ecosystem costs of transport, but even in those cases it is difficult to compare ecosystem harm with more quantifiable harms posed by alternate methods of transportation or with the benefits of building the infrastructure.

III. Simulation of Uruguay Round commitments on trade liberalisation and international freight movements in 2004

Stress on the environment arising from freight transport can be approached by measuring the volume (weight) of traded goods and the distance such goods are carried. Attention is then paid to the particular environmental stresses imposed by the different modes of freight used to transport the total volume of goods from their origin to their destination. In analysing the relationships between trade liberalisation, international transport and the environment, it is necessary to keep in mind therefore the effect of trade liberalisation both on quantities traded and distances transported.

On the whole, it may be expected that the global lowering of trade barriers will lead to increased quantities in transport, as in most cases the volume of goods traded grows. But since at the same time individual bilateral trade flows will change, the transport flows in particular commodities -- that is their origin and destination and hence the distances involved -- will probably vary. Evaluating the overall effects of trade liberalisation on international transport flows -- both in terms of overall volume and individual inter-regional flows to determine distances goods are transported -- becomes therefore essentially an empirical question.

Using a sophisticated international trade model, the effects of Uruguay Round commitments to reduce trade barriers and trade-distorting measures were simulated (OECD, 1997d). The results indicate that overall, intercontinental sea transport will increase slightly. But the magnitude and direction of such changes will vary widely by export or import flow, commodity sector and region. A few post-Uruguay Round trade flows even show relative decreases in international transport:

- Overall increases in the global volume of goods traded due to the Uruguay Round liberalisation represent in the order of three to four per cent and the international transport associated with these changes in regional trade flows about one-quarter more -- in the range of four to five per cent;
- Per cent changes among commodity sectors are important, with the previously highly protected sectors showing important increases in trade (9-14 per cent for agriculture and 44-49 per cent for textiles/apparel) but not necessarily relatively larger increases in transport. The new level of agricultural goods are transported less far, whereas the large increases in trade of textiles/apparel are associated with even greater increases in international transport;
- Manufactured goods in general (with the exception of transport equipment) show above average increases in trade expansion and are transported relatively even further;
- The continued dominance of heavy, bulk commodities, such as ores, coal and petroleum, in global seaborne trade and their stagnant levels of trade and stagnant or even decreasing distances transported, dampens the total increase in world transport for all commodities;
- Regional differences in terms of the changes in transport are also clearly evident. In terms of exports to all destinations, US exports would show the largest associated growth in transport, whereas all Asian sub-regions would take imports transported from above world average distances;

- Regional differences are even more pronounced according to commodity sector. International transport of agricultural goods would drop by 18 per cent from Europe, whereas Japanese agricultural imports would be associated with a 37 per cent increase in transport. All OECD countries/regions show significant increases in transport of imports of textiles/apparel (+9 to +120 per cent) and all areas (except Japan and Australia/New Zealand) also show increases in the transport of textiles/apparel exports (+9 to +22 per cent).

Nonetheless, changes in international transport associated with the implementation of the Uruguay Round commitments are small compared to those resulting from economic growth for all other reasons. This does not imply that environmental concerns stemming from increased freight movements are unfounded, since international trade and freight movements are expected to grow rapidly due to a number of factors other than solely the implementation of Uruguay Round commitments. Macro-economic model projections of growth in transport of internationally traded goods indicate that growth in 2004, the year of the full implementation of the Uruguay Round commitments, will be 71 per cent. This is more than 15 times greater than the 4.5 per cent attributable to Uruguay Round liberalisation. Sectoral projections show much greater rates of growth in international transport for all manufactured goods, including intermediate goods used as inputs into manufacturing, than for agricultural and mineral primary commodities. Similar to the results of the Uruguay Round simulations, international transport for most sectors tends to increase more under the projections for overall macro-economic growth in 2004 than quantities traded.

IV. Liberalisation/structural reform in the transport sector

A. *The North American experience*

Overall, the intercity freight bill as a percentage of gross national product (GNP) dropped dramatically in the United States after deregulation from 7.8 per cent in 1980 to 6.3 per cent in 1989 (and has since remained at that level) while the average length of haul increased for rail, truck and air. This decrease in cost is primarily the result of traffic being shifted to a more appropriate mode after deregulation, cost reductions due to enhanced competition and technological innovations such as unit trains and doublestacked container trains (OECD, 1997b).

Rail deregulation (the Staggers Act of 1980) changed railways from being one of the most regulated industries in the United States to a market-oriented system. Rail freight rates declined at an average annual rate of 1.5 per cent after 1980. However, the major benefits of deregulation were due to service improvements including speedier and more reliable deliveries. These benefits were estimated to be worth US\$5 billion in 1990. Railway productivity per employee doubled between 1983 and 1992, allowing railways to compete with trucks and barges for the first time in decades. Railways in the United States have regained market share of total ton-miles since deregulation by recapturing the movement of bulk commodities from trucks and by developing long distance trailer-on-flat car/container-on-flat car (TOFC/COFC) routes. Rail freight use of energy in the United States declined by over 26 per cent or 26 million barrels from 1980 to 1993 while rail ton-miles increased 27 per cent. Part of the energy reduction is due to the improved financial status of railways, allowing the purchase of new more efficient locomotives and infrastructure improvements. Rail deregulation allowed the abandonment of miles of rail track and realignment of infrastructure. About 25 per cent of US railways have been abandoned since 1975.

Trucking deregulation in the United States also occurred in 1980. Deregulation cost savings (to the trucking industry) were estimated to be 23 per cent of 1980 costs by 1984. Equipment utilisation in the motor carrier industry improved as a result of deregulation due to the freedom to abandon or adjust routes and the freedom to obtain backhauls. Consequently, there were fewer heavy duty tractors in use in 1993 than in 1980 but intercity truck ton-miles increased 55 per cent. Although many motor carrier bankruptcies and job losses were attributed to the competitive pressures of deregulation, employment in trucking has grown by over 500 000 since 1980.

Deregulation of railways and trucking and advances in technology have led to the rapid expansion of all types of **intermodal traffic** in the United States. All TOFC/COFC traffic grew at a compound rate of 7 per cent from 1980 to 1994. The number of doublestack container trains from the West Coast to the Midwest and East has increased from one train per week in 1984 to 241 (including five to Mexico City) trains per week in 1993. Much of this growth was originally in ocean containers but the two largest truckload carriers subsequently switched to truck-rail intermodal almost exclusively for long distance moves in 1994. Doublestacks require less energy and cause less congestion than regular trains and require much less energy (and labour and other resources) than conventional long haul trucks. New technologies like roadrailers are also contributing to increased efficiencies and reductions in energy consumption and congestion.

Inland waterway traffic was never effectively regulated so has not been affected directly by deregulation. Although waterways are fuel efficient and highway and rail traffic congestion is reduced when traffic goes by water, the environmental movement has generally been opposed to expanding the use of this mode in the United States. Traffic growth has continued, however, as the waterways are generally the low cost mode for bulk commodities for a large part of the United States. Although barges do not generally participate in intermodal container movements, rail-barge bulk movements have greatly increased with the new land-locked short-line railways transferring at river terminals.

Coastal shipping is not an important part of US commerce. However, the Jones Act (of 1920) also restricts cabotage on the non-contiguous ocean routes from the US mainland to Alaska, Hawaii and Puerto Rico. The lack of competition on these routes is estimated to cost US consumers \$10 billion per year. Potential savings from abolishing the Jones Act would be due mainly to competition from foreign ships.

NAFTA is likely to change the traditional transportation trading and infrastructure patterns of the three North American countries from an east-west orientation to more of a north-south one. Cross border rail and intermodal movements from eastern Canada and the United States to Mexico are expected to increase as rapidly as the Mexican infrastructure can be improved. Although technically possible prior to NAFTA, this crossborder traffic is driven by increased demand from trade liberalisation and relaxation on foreign investment in infrastructure in Mexico. Motor carriage harmonization between the United States and Canada has proceeded relatively smoothly. The United States, Mexico and Canada have all accepted the principle of adopting comparable standards with enhanced safety and all three countries have made significant progress in several areas. However, the United States and Mexico are behind schedule in resolving the cross-border size, weight and safety differences that would allow increased trade using motor carrier transport between the two countries. NAFTA has increased competition between US and Canadian ports for international cargo (as well as land bridge traffic). Mexican ports, especially on the Gulf of California are expected to compete for traffic between the Pacific Rim or the West Coast of South America with all three NAFTA countries, when Mexico's transportation and port infrastructure is sufficiently improved. These shifts will generally result in reduced energy consumption and congestion and be environmentally friendly if the appropriate infrastructure is provided.

Deregulation of the transportation industries in North America, and particularly in the United States, has led to major improvements in operating efficiencies, service levels and, for the railways at least, in profit levels. Improved transportation services have provided major benefits to the rest of the US economy as both transportation costs and inventory levels were reduced for most sectors of the economy. Although not without controversy, it can be concluded that the results of deregulation, along with technological advances in transportation have been environmentally friendly. Less total energy is used by railways than in 1980. Doublestack trains (and to a lesser extent roadrailers) have reduced energy and highway congestion. Motor carriers use substantially less energy per ton-mile than in 1980. Motor carrier equipment utilisation has improved and the use of truck-rail intermodal movements has reduced the motor carrier industries' relative contribution to road and highway congestion.

B. The European experience

Historically, the freight transport market in Europe has been strictly regulated. Regulation has consisted of fixing tariffs and setting quantity restrictions for market entry (licenses), quality requirements (capital, reputation), working conditions (driving time) and standards for vehicles and operation (weights, measures, speeds, access) (OECD, 1997c).

In the European Union as the single market was pursued it became clear that a common transport policy could only consist of a liberalised market structure and not a system of strict market regulations. In 1985, a decision of the European Court of Justice initiated a period of fast and occasionally hectic liberalisation which focused on the road haulage market. Tariff regulation was abandoned completely and in succession: market access was extended to remove quantity limitations; driving/rest time, quality regulations and technical standards were harmonized (at a low level); and partial cabotage was introduced.

In the **railway sector**, the basic principles for market oriented development were formulated in the EU Commission Directive 91/440. This obliges Member States to reduce state involvement and increase the competitive power of the railway companies by decreasing accumulated debt, introducing commercial financial management, substituting flat rate subsidies by contracting out public services, separating the infrastructure accounts from the operating business and providing access to the infrastructure for third parties. Apart from payments for public service and specific funding for infrastructure provision, the railways are to finance their operational activities without state subsidisation. Although some reforms have been undertaken (in Sweden, Germany and the United Kingdom), these have not increased competition in international rail transport. The main reasons are threefold:

- Supplementary directives of the Commission, which are key to defining the conditions for free access to the infrastructure and the associated railway slot pricing, were scheduled to be introduced before the end of 1997 but are still not in place. Furthermore the conditions for alliances between railway companies are still not clear;
- The relationships between the designated railway companies and governments are highly complex, for example six Member States have still not implemented Directive 91/440. In other countries, the implementation has only led to adjustments, not structural change;
- Management of the public railways is not intrinsically interested in this kind of change because they feel more comfortable with the current heavily regulated situation rather than in a free market environment.

Transport on **inland waterways** was widely liberalised by the Mannheim Agreement of 1868, an accord that guaranteed free shipping on the river Rhine. Barriers to competition were only set for the

waterways in Northern France and the Benelux where the *tour-de-rôle* system of allocating freight to French/Benelux carriers was established. And there is no plan to abandon these barriers before the year 2000. As transport on Europe's busiest waterways was not regulated, the main public interventions consisted of subsidisation and infrastructure provision. Harmonization of transport subsidisation policy, which began with Directive 70/1107, in the EU member countries has helped slow down the use of subsidies and stabilize the market for inland waterway shipping.

The **road transport** market is widely liberalised in most EU member countries, but only minor progress has been made to create fair market conditions by harmonized taxation, environmental/safety regulation and enforcement of social regulations. Although member states have fixed the lower and upper levels of fuel taxes, differences in levels in diesel taxation are still high. As regards vehicle taxes, the level of tax for a 40-tonne truck differs widely throughout the EU. In six countries, a time-based motorway toll is levied while others apply motorway tolls based on usage. Austria is the only country that levies time-based, as well as usage-based tolls on their motorways. As driver costs account for 50 per cent of total operating costs, there is a high incentive to violate the regulations of transport operations (driving bans on weekends, permits for combined transport activities, and the enforcement of the maximum driving/minimum rest times). Since 1996, the not very stringent EURO II environmental standards restrict the maximum emission values of CO, HC, NOx and particulates. Many truck manufacturers have already announced that they are able to meet the EURO III standards which will not be introduced until 1999. This indicates that environmental policy is lagging behind the technological progress which, in turn, is not strongly influenced by the announcement of future standards.

The performance of railways and inland waterways exceeds these environmental standards. As regards safety regulations, the gap between rail and road standards is wide. The leading principle for rail safety standards is the absolute "maximum" which can be achieved by technical measures and operating control. For road transport the leading principle is a "relatively" safe operation, i.e. it is enough that road transport improves its safety performance in terms of accidents per tonne/km year by year. Such difference of treatment implies that railways and inland waterways bear about eight times higher costs compared with the road sector to avoid levels of environmental and safety standards from deteriorating.

Freight transport markets in Europe have changed dramatically in the past two decades. All relatively environment-friendly modes have lost market shares while road transport has expanded. Railways have lost in absolute and relative terms. Reasons include the structural change in market demand, their inertia to adjust to demand requirements, slow progress of railway reforms due to political protection and the lack of harmonization such as balanced regulation and internalisation of externalities. The potential for rail freight markets to transport high volumes over long distances therefore has not been exploited. Also, international combined transport (multimodal) has not taken off and remains a marginal competitor.

Sweden, Finland and Austria joined the EU at the beginning of 1994, after the first phase of the EC-wide liberalisation policy. They have implemented environmental policies in the transport sector which correspond closely to the issues of the Green Papers of the EU Commission. This is also reflected in the modal split figures which show a better market position of environmentally friendly modes. Also the modal split of transit traffic is influenced by this policy, as for instance trans-Alpine intermodal transport to and from Italy. Austria and Sweden are the only EU countries which are willing to support the Commission's Green Paper on Fair and Efficient Pricing and implement appropriate policies. Switzerland is preparing a fiscal reform for the transport sector to implement the principle of "true costing" of all infrastructure and external costs to the responsible units, a principle which corresponds to the ideas published in the Green Paper on Fair and Efficient Pricing in Transport. Nevertheless, Switzerland and Austria are under heavy pressure from the majority of EU member countries and the

Commission itself to abolish their existing pricing/regulation practices and to adjust to the EU average or mean values.

Central and eastern European countries (CECs) have been experiencing rapid change in their economic structures since the beginning of the 1990s. This includes freight transport where the rail market share has plummeted from the high position it formerly held due to public protection. In contrast with a number of EU countries, Poland, Hungary and the Czech and Slovak Republics have initiated railway reforms which might help limit the loss of market share, assuming the railway companies become strong enough to compete successfully. Nevertheless a further decline of environmentally friendly modes will be unavoidable unless a strict environmental pricing/regulation policy is applied, although as economic goals are the dominant concern for these countries in transition, it is difficult to envisage that this will be easily achieved.

There is enough statistical evidence to support the following hypothesis: the way the liberalisation process has been organised in the EU has had a significant impact on the freight transport market structure. The process started in 1985 with the road sector and, except for some minor changes for inland waterways, it has left the railway sector basically unchanged. The opening up of the road sector to competitive forces was not accompanied by any framework of social, environmental and safety restrictions to harmonize intermodal competition. Therefore, there are strong indications to support the argument that the absence of harmonization accelerated the modal shift from rail and waterways to the roads. However, as it seems impossible to stabilise an inefficient public sector rail system when there is strong market competition, we cannot conclude that the more environmentally-friendly modes would have stabilised or even increased their market position if the old regulatory regime had continued. One approach to reducing the environmental stress associated with the decline in rail freight market shares would be to speed up the process of rail deregulation, perhaps in combination with more privatisation of the industry. There is clearly a move in this direction, but change is slow. Thus separation of the railway companies from national policy controls could allow them to develop commercially and internationally in profitable market segments. Alliances through joint ventures and mergers among railway companies and private shippers, forwarders and intermodal haulage companies could be formed. By first becoming strong enough to compete and attract customers by lowering prices and offering better services, railway companies can then make use of harmonized market conditions.

V. Concluding remarks

There are expressions of concern on the negative environmental impacts of a rise in freight activity. Such concerns are due not only to the overall continuing rates of such rises but the fact that road haulage and heavy goods vehicles are carrying most of the increment. Energy use and various air pollutants are markedly heavier for trucking than for other modes of freight transport. The series of investigations undertaken by the OECD Joint Session were designed to provide more information on the relative importance of the sources of increased freight movements and whether reform of the transport sector, as a services sector, designed to provide economic efficiencies, could also be expected to lead to environmental efficiencies, i.e. a more intensive use of a lower level of resources.

As a more precise (and narrow) subset of that exercise, in a simulation of the changes in world bilateral trade flows arising with Uruguay Round trade liberalisation commitments, it was found that these would -- globally -- lead to a small increase in trade flows and a slightly greater increase in intercontinental transport flows. The scale effect was however far from automatic; certain bilateral relations and certain commodity groups actually would undergo a decrease in transport. Using as a basis for comparison the macro-economic projections of a well known forecasting firm, intercontinental freight

flows could be expected to increase by around 70 per cent or some 15 times more than the modelled increase in volume of freight movements associated with the Uruguay Round trade liberalisation commitments. Within Europe, the situation is basically similar, but certain ecologically sensitive areas and corridors for transit traffic would be associated with increases in freight activity well above the average associated with the Uruguay Round reduction in trade barriers.

Increasingly, service sectors are also being liberalised in order to introduce economic efficiencies, to promote growth and reduce public sector controls. Transport, as an important service sector in OECD economies which traditionally has been highly regulated, is no exception. The Joint Session of Trade and Environment Experts examined two regions where liberalisation and structural reforms in the transport sector were underway: North America and Europe. In the case of North America and particularly the United States, deregulation began in 1980, almost simultaneously in the rail and road sectors. Important economic gains have been made, which in many cases have also permitted environmental improvements through the adoption of new technologies and infrastructure investments. In particular, energy consumption for the sector has gone down and intercity freight movements by rail have increased relative to those on road.

In Europe the situation is rather different. Road haulage has dramatically increased, both absolutely and in relative terms. The work commissioned by the Joint Session points out that there are various reasons for the environment-friendly modes like rail, inland waterways, coastal shipping or pipelines having lost market shares, but evidence points to the significance of the manner including pace and sequencing, in which liberalisation has been carried out in the various transport modes. European common market policy first focused on creating a free market situation for the road sector whereas the rail and inland waterway sector reforms lagged behind. Competitive conditions between the deregulated road haulage and the other modes, particularly rail, continue to vary greatly. External diseconomies are not internalised and harmonization is missing. Harmonization concerns social regulation, fiscal harmonization and safety regulations. The enforcement of social regulations (driving and rest times) also seems to be a key factor for intermodal competition. The potential environmental advantages of rail, waterway shipping and pipelines are not transformed into market advantages, in part because there exists no common internalisation policy. In sum, the analysis concluded that the way in which EU liberalisation policy has been implemented has favoured the less environment-friendly modes and accelerated the decline of rail and inland waterways. Further, the analysis suggests that internalisation, while important, will not alone be sufficient to recapture market shares for the more environmental-friendly freight transport modes.

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