

REGULATORY REFORM IN ROAD FREIGHT

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INTRODUCTION

The road freight industry consists of the transportation by road of goods between firms and between firms and consumers. In the past two decades, this mode of freight transportation has grown very rapidly: for instance, its output (in terms of billion tonne-kilometers) has doubled in the broad European area (ECMT, 2000). Over the same period, there was a tendency in many OECD Member countries to implement major liberalisation packages. However, in many countries, regulations still restrict market entry and the choices of firms. This paper analyses regulatory developments across OECD Member countries in the road freight industry, with a focus on how these developments have affected competition and thus performance.

The paper is limited in scope. While the road freight industry involves externalities that may justify a certain amount of government intervention (such as safety, noise and emissions), the paper deals only with so-called economic and administrative regulations. Although inter-modal competition between road transport companies and other transportation modes (such as rail freight and air and maritime cargo) has had an important influence on industry and regulatory developments, only regulation and competition within road transport itself are analysed. Similarly, the paper does not address regulatory issues related to the provision of the road infrastructure, such as efficient pricing of access and capacity expansions. Finally, the analysis of the different segments of the industry – own-account freight, truckload freight and less-than-truckload freight – is only sketched.¹

The analysis is divided into four parts. First, structural developments in the industry are outlined. Second, the main features of the regulatory framework are reviewed. The third part compares regulatory approaches on the basis of quantitative indicators of the degree of restrictions placed on market mechanisms. The last part summarises the main outcomes of regulatory reform. The data on regulation and market structure are taken primarily from the OECD *International Regulation Database*.²

STRUCTURE AND PERFORMANCE OF THE INDUSTRY

The road freight industry is geared to distribution, logistics and basic physical transport. Transport can be for own-account (*e.g.* freight transportation between establishments of a same firm) and for hire or reward. Road freight is a key sector

of the economy, playing a major role in market integration and having a direct impact on transaction costs for economic agents. In 1996, the sector accounted for 92 per cent of all inland freight transport in Japan, 73 per cent in the European Union and 29 per cent in the United States (Table 1).³ In 1996, road freight transport accounted for about 1 per cent of GDP and employment in the European Union and the United States and a larger percentage in Japan and some European countries. However, these statistics fail to account for own-account transport.⁴

Two main market segments can be distinguished in the road freight industry (Biggar, 2001). Truck-load (TL) freight, on which this paper focuses, accounts for the largest part of the industry. It is characterised by few economies of scale and scope and a substantial scope for competition in the relevant markets, defined as transportation services between two locations within a certain period of time. This is because freight services consist mainly of flows of goods between firms, which involve a relatively low time-sensitivity and an efficient vehicle size that is typically small relative to market demand. Less-than-truckload (LTL) freight comprises services in markets where flows are relatively sparse (*e.g.* flows to individuals) and timelessness is important and, therefore, loads at each point in time may be smaller than the efficient size of vehicles. In this segment, including for example parcel or express delivery services, economies of scale and scope can be important and there is a tendency towards hub-and-spoke operation.⁵ Although this market segment tends to be more concentrated, effective competition can emerge, especially when sustained by competition policy enforcement.

Overall, the road freight industry is characterised by the predominance of small firms in Spain, Italy, Finland and Portugal and by larger firms in Mexico, Japan and the United States (Table 1).⁶ Despite increasing co-operation among road freight companies and a tendency towards larger firms in the LTL segment, the industry is not highly concentrated, the market share of the top three firms seldom exceeding 5 per cent of total tonne-kilometers transported.⁷

In many OECD countries the industry has a large number of small firms providing basic transport services and a limited number of major hauliers providing more sophisticated logistics services. Firms in the first category compete mainly on price. Barriers to entry are low because little start-up capital is needed. Firms in the second category compete both on price and the range and quality of services. Increasing use is being made of information and communications technologies such as electronic data transfers and tracking systems as they enable hauliers to provide better quality services ("just-in-time" deliveries, reliability, flexibility) to a much wider range of destinations thanks to improved productivity. Greater competition and the need to innovate seem to be leading to a process of concentration and co-operation with, for example, the creation of firm networks. At the same time, changes in the structure of demand are leading to greater specialisation.

Table 1. Selected industry statistics, 1996

	Structure					Performance				
	Road freight employment as a percentage of total employment	Road freight (tkm) as a percentage of the total inland freight (tkm)	Share of each country in total OECD road freight per cent	Road freight GDP as a percentage of total GDP	Share of international haulage by domestic hauliers ¹ per cent	Number of employees per company	Labour productivity (000s US\$) ^{**}	Turnover per employee (000s US\$) ³	Turnover per company (000s US\$) ²	Tonnes km per employee (000s)
Austria	1.0	41	0.5	0.9 ³	59	7.8	59 ³	118	921	0.45
Belgium	1.2	68	0.9	1.2 ³	55	4.6	65 ³	238	1 102	0.74
Canada		25	3.2		21				1 039	–
Czech Republic	4.1	54	0.9		53	6.2				0.15
Denmark	1.5	73	0.4	1.5 ⁴	55	3.8	58 ⁴	82	309	0.39
Finland	1.4	72	0.7	1.3 ³	10	2.5	59 ³	113	289	0.85
France	1.2	75	6.7	0.7 ³	14	7.4	42 ³	109	803	0.85
Germany	0.7	66	8.2		15	4.3		145	622	–
Greece	2.7	98	0.5		6	9.7		14	131	0.15
Hungary	1.6	52	0.4		44 ⁵	3.2		8	26	0.25
Ireland	0.7	90	0.2	0.4	4	4.8	32	89	423	0.6
Italy	1.2	86	5.8	0.9 ³	7	2.4	36 ³	107	261	0.74
Japan	1.8	92	8.9			25.4		92	2 346	0.26
Luxembourg	1.9	70	0.1	1.1 ³	87	10.9	52 ³	138	1 504	0.48
Mexico	1.8 ¹	80 ²	5.0			50.5 ¹		13 ¹	641	0.54
Netherlands	1.9	50	1.3	1.3 ³	58	12.8	50 ³	95	1 212	0.43
Poland		40	1.6		11	3.4 ⁵				0.3
Portugal	0.7	87	0.4		14	2.8		57	157	0.44
Spain	1.9	85	2.7	1.6 ⁴	25	2.0	32 ⁴	61	119	0.38
Sweden	1.1	62	0.9	1.1 ³	9	5.1	61 ³	122	618	0.69
Turkey		93 ²	3.6		10					
United Kingdom	1.0	85	4.4	1.0	10	6.3	47	101	640	0.61
United States	1.4 ¹	29	42.0	1.2 ¹		22.2 ⁶	59 ¹			0.86
European Union	1.2	73	33.5	1.0 ³	19	3.9	52 ³	101	392	0.68

* Based on haulage in tkm.

** Value added per employee (converted at current exchange rates).

1. 1997.

2. Total freight is only road plus railways.

3. 1995.

4. 1993.

5. 1994.

6. 1998.

Sources: European Commission, "Transport in figures, January 2000"; Eurostat, "Memo No. 5/99, 21 May 1999"; OECD International Regulation Database; Eurostat; Transport Canada; BTS 1999.

The internationalisation of the road freight transport sector varies widely across countries. In 1996, Austria, Belgium, Denmark, Luxembourg, the Netherlands and the Czech Republic were the only countries in which domestic hauliers had more international than domestic business. Apart from geographical location and country size (international traffic is naturally biased downwards in island countries and upwards in small continental countries), restrictive bilateral arrangements, notably implying restrictions to cabotage (see below), and organisational and service quality factors played an important role in shaping trade patterns.⁸

Measuring productivity in service industries is notoriously difficult (see, for instance, Bosworth and Triplett, 2000), especially because output and value added are not always well defined and comparable across countries. It is not surprising, therefore, that comparative productivity patterns in road freight are not completely consistent across productivity measures. Labour productivity (measured as value added per employee in current US dollars) varies greatly from one country to another. Belgium and Sweden appear to have the highest productivity, followed by the United States, Austria and Finland. In contrast, Ireland, Italy and Spain have relatively low productivity. It should be noted, however, that this measure of productivity is imperfect because it does not account for differences in purchasing power across countries and, due to data limitations, the reference year is not always the same across countries. These top and bottom rankings are only partially confirmed by other measures of productivity, such as tonnes-kilometers or turnover per employee (for instance, the relative rankings of Austria and Italy are reversed in terms of the former).

THE REGULATORY FRAMEWORK IN OECD COUNTRIES

The road freight industry is a structurally competitive sector dominated by competition on price and service quality. Two broad categories of road freight regulations exist in OECD countries: regulations on traffic and vehicles and regulations on the operation of the market. The first category includes the highway code, labour regulations, regulations on the carriage of hazardous substances and traffic restrictions. The second category covers mainly market access conditions and price regulations.

The main rationales for regulating the road freight business relate to road safety, the environment and the use of the fixed infrastructure. The industry has important externalities related to car accidents involving heavy vehicles, harmful noise emission levels, air pollution from vehicle exhaust and congestion on and damage to the road network. These imply legitimate social, environmental and economic concerns that have been addressed through safety and technical standards, rules on traffic and driving conditions and charges on the use of highways. In the past two decades, most OECD countries have strengthened

safety and environmental controls and some have improved the efficiency of road charging systems. The challenge facing road freight regulators is to do so without distorting the extent of competition within the industry and between the industry and other modes of freight transportation.

This section analyses so-called “economic” regulations related to the conditions of entry into markets for road freight services, and the provision and pricing of these services. The focus is on the distortion to domestic and international competition that these regulations imply.

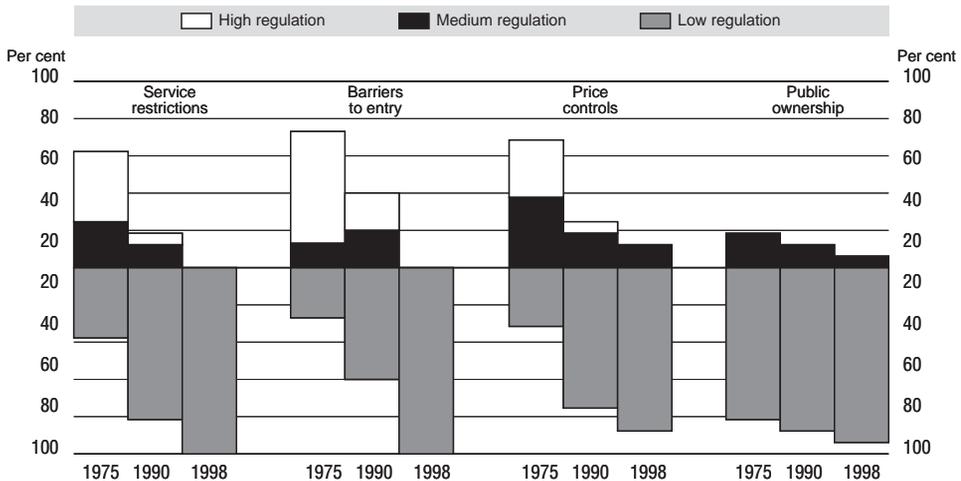
Historical developments

Historically, economic regulation of the road freight industry has often been motivated by the wish to protect the regulated rail industry, as well as by “public service” considerations⁹ (OECD, 1990). According to the US Bureau of Transport Statistics (1999a), in the past the regulation of market access and prices has also been motivated by concerns within the industry that cut-throat competition would cause instability, would lead to road haulage firms going bankrupt and would worsen working conditions.

Regulatory reform aims at easing the conditions of entry to the sector and liberalising prices and the supply of transport services. Greater competition between road hauliers can promote improvements in productive efficiency and the quality of services while at the same time lowering prices. The time scale of liberalisation has varied across countries. For example, in Australia it began with the constitutionality of federal regulations being called into question (OECD, 1990). In the United States, the 1980 Trucking Act transformed the sector and abolished most of the economic regulations (OECD, 1997). In Japan, heavy goods vehicles have been subject to less stringent regulation since 1989 (Yamauchi, 1995). In the EU countries, liberalisation has been gradual and spread over the period between 1989 (freeing of international haulage rates) and 1998 (total liberalisation of cabotage) (Burckhardt *et al.*, 1998). In the Central and Eastern European countries, the adoption of market economy principles at the start of the 1990s led to a complete reorganisation of the transport sector, with gradual liberalisation and privatisation of state transport undertakings (ECMT, 1996). Figure 1 shows the dynamics of deregulation in OECD Member countries between 1975 and 1998. Countries are classified according to the degree of regulation (high, medium, low) on four criteria: public ownership, barriers to entry, price regulation and constraints on services (for a description of these indicators, see OECD, 1992, and Gönenç *et al.* 2000).

This wide-scale liberalisation has involved the elimination of quantitative restrictions (limits on market entry, etc.) in favour of qualitative criteria (minimum standards), and the gradual liberalisation of domestic and international markets

Figure 1. Regulatory reform in OECD countries¹
Percentage of countries in each category



Note:

High regulation: Entry is restricted, public ownership is substantial and/or prices or services are set or approved by a regulatory authority.

Medium regulation: Some limited entry is allowed, public ownership is limited and/or businesses have some freedom to set prices or services.

Low regulation: There is no public ownership, businesses are free to enter and/or have full control over prices and services they supply.

1. See Gönenç *et al.* (2000) for details on the construction of the indicators.

Source: OECD, *Regulatory Reform, Privatisation and Competition Policy*, 1992; and OECD *International Regulation Database*.

accompanied by a reduction in price controls (see below). In federal countries, deregulation at federal level has usually preceded liberalisation at State level (for example, in Australia, Canada and the United States).¹⁰ As a result, even in countries where liberalisation at the federal level has been implemented, vestiges of the earlier regulatory regime remain at the State level, such as limited antitrust immunity for collective rate making in interstate trucking (through so-called “rate bureaux”) in the United States (OECD, 1999*a*).

The situation in 1998

So as to afford the widest possible overview of the current state of regulatory reform in the road freight industries of OECD Member countries in 1998, different types of regulation will be addressed separately: procedures and criteria for market entry; restrictions affecting foreign hauliers; restrictions affecting certain

activities; price regulations and driving time regulations.¹¹ The role of industry bodies or commercial lobbies in defining and implementing the regulations and the impact of government supervision of certain companies are also considered. The country coverage of the analysis differs between these different types of regulation (details are provided by Boylaud, 2000).¹²

Market access

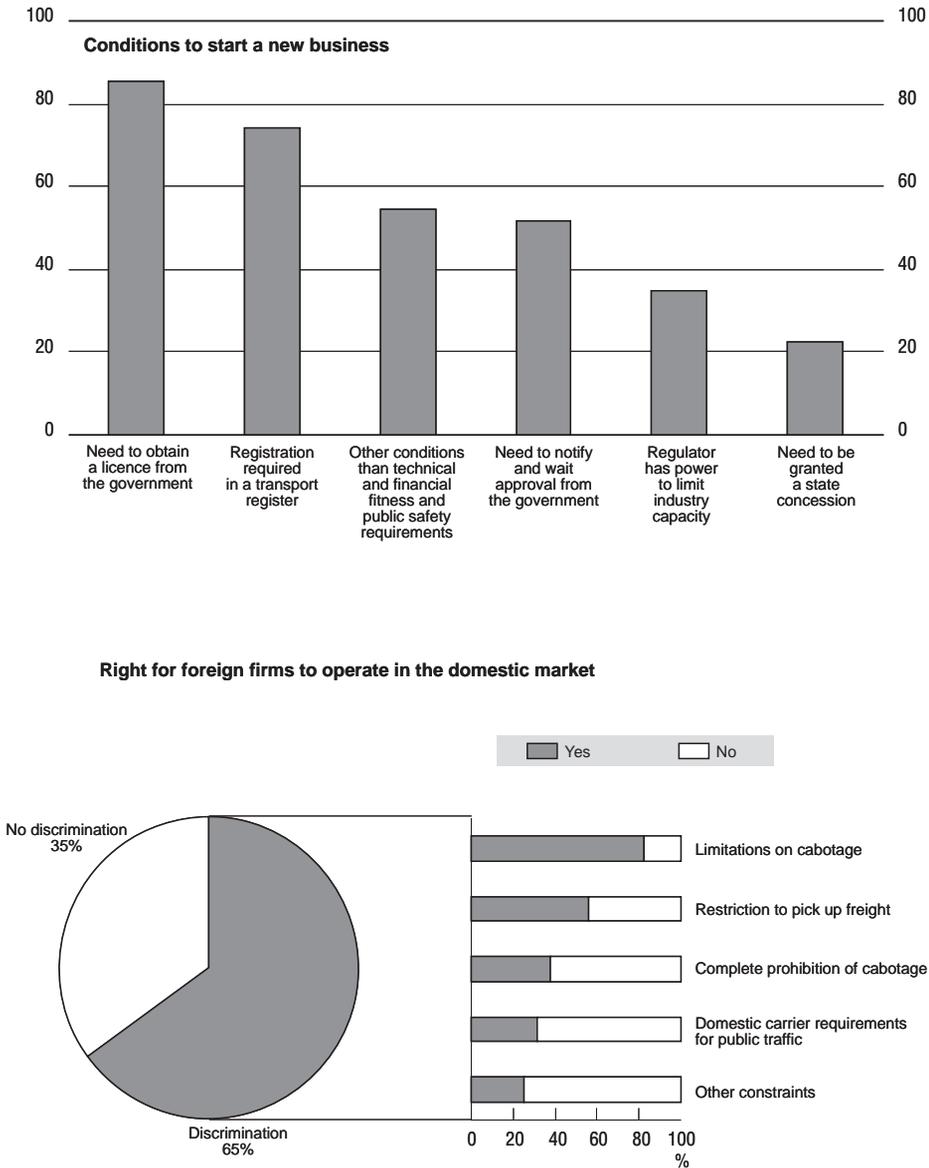
In the vast majority of countries, a licence or permit is required to set up a new road freight company, as is registration (Figure 2, top panel). In many cases, the operation can start only once approval is obtained. On the other hand, the permits are usually open-ended and valid throughout the entire country.¹³ In Italy, the United Kingdom, Mexico, New Zealand and Spain, the entry regulations also apply to own-account transport. One point to note is that the regulations on access to the road freight business described here come on top of administrative procedures which apply to all firms.¹⁴

In many countries criteria other than technical requirements, financial soundness, moral soundness and public safety requirements are still taken into consideration in deciding on the entry of new operators. However, these additional requirements do not exist in common-law countries (North America, the United Kingdom, Ireland and Australasia), some North European countries, Greece and Portugal. In several countries (Germany, Italy, Belgium, Greece, Spain, the Czech Republic, Hungary, Poland and Korea), the regulator also has the power to limit sector capacity.

Apart from some island countries in which restrictions on foreign hauliers do not have much meaning, in most OECD Member countries, foreign firms do not have the same rights as domestic firms.¹⁵ A number of limitations apply (Figure 2, bottom panel). Generally there are still limitations on cabotage.¹⁶ For example, in the European Union, cabotage was fully liberalised in July 1998 (the liberalisation process had begun in July 1990, with the introduction of a limited number of cabotage licences), but applies only to EU member states and excludes hauliers from Central European countries. The obligation to use domestic hauliers for government contracts still existed in 1998 in five countries: Greece, Mexico, Norway, Hungary and Poland.

In the context of liberalisation of the sector, most transport activities have been opened up to domestic competition and restrictions concerning particular activities (such as private carriage, backhauling, contract carriage or intermodal operations) are increasingly rare. However, own-account transport remains restricted in several countries (Germany, Finland, Greece, Mexico, the Netherlands and Switzerland). Return freight¹⁷ and contract transport are now limited in only a few countries (for example, Finland and Greece), and intermodal operations remain restricted in three countries (Finland, Hungary and Mexico).

Figure 2. **Entry regulations, 1998**
 Percentage of countries concerned by regulations



Source: OECD International Regulation Database.

Market operation

Price controls, even partial ones, are also increasingly rare. However, in 1998 controls still applied in four OECD Member countries (Greece, Japan, Italy and Spain). Furthermore, in several European countries there have been calls to reintroduce minimum prices (ECMT, 1998).

While state ownership is becoming a relatively minor phenomenon in the road freight haulage industry,¹⁸ there are nevertheless several countries with state-controlled companies operating in the road freight haulage sector (Australia, Belgium, the Czech Republic, Denmark, Germany, France, Finland, Norway, Poland and Turkey). Often they are subsidiaries of state-owned companies in other sectors, such as the railways or post office and concentrate on only a few activities.

Except for Mexico and Korea, all of the other OECD Member countries have specific regulations on driving and rest times.¹⁹ Authorised daily driving time is fairly similar across countries (8 to 9 hours).²⁰ But the allowed times for activities other than driving varies a great deal. For example, in 1998 the working hours for drivers absent for at least three nights a week varied between 67 hours in Germany and 52 hours in Italy.²¹

The role of industry bodies

It is not easy to analyse the role of industry bodies or commercial interests in shaping and implementing the regulations applicable to the sector. In fact, it can be interpreted in two diametrically opposite ways: firstly as part of a consultative effort to involve stakeholders in the decision-making process; and, secondly, as a way of protecting firms already in the market (acting as their own judge and jury).²²

Involvement of industry bodies in regulatory decisions varies widely among OECD Member countries, but in more than half of the countries covered by this study these bodies participate in decisions concerning entry, pricing or both. In common-law countries, some Nordic countries and Korea, industry bodies have no part in defining or implementing the regulations. In contrast, in four countries (Spain, Hungary, Italy and the Czech Republic) they are involved both in setting and regulating fares and in regulating market access. In Germany, Belgium, France, the Netherlands, Poland and Switzerland, they are involved in defining market entry conditions.

INDICATORS OF REGULATION IN THE ROAD FREIGHT TRANSPORT INDUSTRY (1998)

In order to be able to compare regulatory approaches in the OECD countries, summary quantitative indicators were constructed of the various aspects of road freight transport regulations (on a scale from 0 to 6 from least to most restrictive of

competition) and aim to illustrate succinctly the degree of restrictions on market mechanisms. These composite indicators were constructed by aggregating detailed information on regulation (including information described earlier) using data analysis techniques (see the Annex to R. Gönenç, M. Maher and G. Nicoletti in this issue). This detailed information is provided in Boylaud (2000).

Table 2 shows the findings obtained by a factor analysis of the detailed regulatory indicators. These findings allow regulations to be grouped into three main categories, the factors of which explain 68 per cent of the total variance in the data: *i*) barriers to entry (licence restrictions, price controls, involvement of industry bodies in regulating entry and prices); *ii*) involvement in business operation (administrative burdens, simplification of administrative formalities, regulations restricting certain activities and driving times); *iii*) discrimination against foreign firms.

Table 2. **Regulation: the discriminating factors**
Results of factor analysis¹
Rotated factor loadings²

	Factor 1		Factor 2		Factor 3	
Interpretation	Barriers to entry		Involvement in business operation		Foreign discrimination	
Detailed indicators ³	Factor loadings	Weights of variables in factor	Factor loadings	Weights of variables in factor	Factor loadings	Weights of variables in factor
Involvement of professional associations ⁴	0.85	0.37	0.13	0.01	0.14	0.02
Licencing requirements	0.83	0.36	-0.37	0.08	-0.03	0.00
Price controls	0.65	0.22	0.40	0.09	-0.13	0.02
Restrictions on behaviour	-0.03	0.00	0.82	0.38	-0.04	0.00
Coverage of licences	-0.08	0.00	0.66	0.25	0.28	0.07
Simplification of rules and procedures	0.30	0.05	0.58	0.19	-0.15	0.02
Discriminatory procedures	0.03	0.00	0.05	0.00	0.95	0.87
Weight of factors in summary indicator	0.41		0.37		0.22	
Selection criteria:						
Eigenvalues	2.03		1.68		1.02	
Total variance explained			67.6			
Test-statistics						
Bartlett's test of sphericity	Chi-2		20.9			
	Df		21			

1. Extraction method: Principal Component Analysis. Rotation method: Varimax with Kaiser normalisation.

2. Factor loadings measure the correlation between the individual indicators and the latent factors. Indicators are assigned to the factor to which they are most correlated. The rotation of factor loadings is a transformation aimed at minimising the number of indicators that are highly correlated with more than one factor.

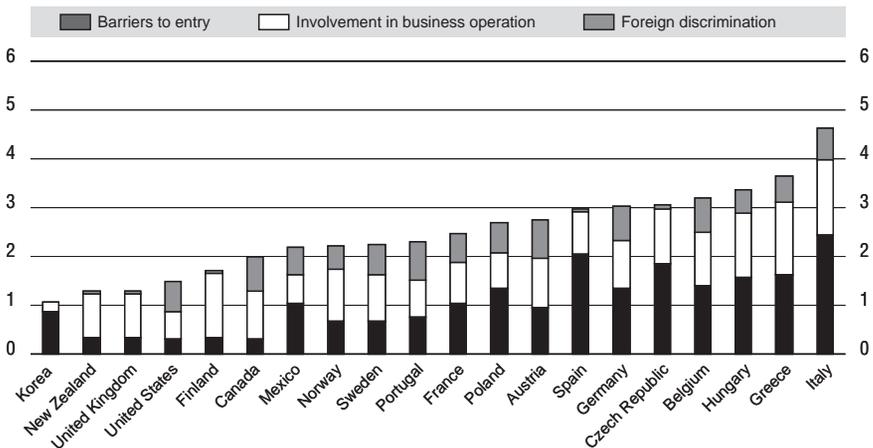
3. See Boylaud (2000) for the precise definition of the indicators.

4. In decisions concerning entry and prices.

Using the estimated weights, three summary indicators of regulation were constructed. Those indicators were used to rank countries along the different dimensions of regulation identified by factor analysis.²³ The summary indicators of barriers to entry, involvement in business operation and foreign discrimination were further aggregated into an overall summary indicator of regulation in the industry. The aggregation was made by weighting each summary indicator by the extent to which it explains the overall variance in the three factors. Figure 3 shows country rankings for the overall summary indicator as well as the contribution of each summary indicator to the overall ranking.

In 1998, Italy and Greece were the countries with the most restrictive regulation overall; the least regulated countries were Korea, New Zealand, the United Kingdom and the United States.²⁴ The relatively restrictive overall stance of regulation in Italy and Greece reflects especially the stances as regards access and involvement in business operation. Also, in 1998 the countries that discriminated most against foreign firms were Austria and Portugal and to a lesser extent several other European countries and North America.²⁵ Of those countries that have a large amount of border traffic, the least discrimination was in Spain and the Czech Republic. It should be pointed out however that this ranking does not take

Figure 3. Summary indicators, 1998¹



1. The scale of the summary indicator is 0-6 from least to most restrictive. See Boylaud (2000) for details on the construction of indicators.

Source: OECD.

account of regulations affecting traffic and vehicles, and that it relates to the situation in 1998. Lastly, it should be stressed that there is a difference between regulatory practice and the regulatory framework, and the most regulated countries are also those with the largest number of very small firms – which are usually subject to less stringent traffic and vehicle regulations than larger firms (see Table 1).

THE IMPACT OF REGULATORY REFORM IN THE ROAD FREIGHT INDUSTRY

The experience of countries that have reformed their regulatory framework indicates a major impact of liberalisation on the efficiency of the sector and the costs of freight transport. For example, in a 1987 study, the Mexican authorities estimated the cost of regulating the sector at 0.5 per cent of GNP (OECD, 1999b) and it is estimated that in Germany – prior to liberalisation – regulation accounted for excess costs of 30 to 40 per cent for long-distance transport [Lieb (1991), quoted in McKinnon (1996)]. Table 3 illustrates the economic outcomes of the reform of road freight transport regulation on the basis of the findings of several empirical studies. It shows that, as a general rule, full liberalisation of the sector has had a beneficial impact on business entry rates (up), prices (down) and service quality (up), and has improved industry efficiency.²⁶ By increasing competition, opening up the market promotes innovation and encourages firms to improve their services and develop a wide range of specialist and sophisticated transport services (OECD, 1997).

The available evidence shows that, contrary to industry predictions, liberalisation has not led to destructive competition, instability or a reduction in safety standards (Biggar, 2001, and references therein). For example, in both Australia and the United States competition is thriving but no adverse effects on the industry were experienced after the elimination of entry barriers and pricing restrictions. In the United States, despite a dramatic increase in truck traffic, safety actually improved after liberalisation, with the number of years of potential life loss declining by over 30 per cent in 15 years.²⁷ There is also evidence of a decline in the incidence of heavy vehicles involved in fatal accidents in Australia since liberalisation (Biggar, 2001).

Liberalisation has also increased trade. In Mexico for example, liberalisation lowered prices significantly and increased traffic volume by 50 per cent between 1989 and 1995 (OECD, 1999b).²⁸ Within the European Union too there was an increase in cross-border traffic once trade barriers affecting road freight came down, but the specific impact of liberalisation is more difficult to gauge as it is recent and has been introduced against the background of the creation of the Single Market.

Table 3. **Product market liberalisation and performance**

Author	Country/period	Explanatory variable	Performance variable	Effects found
Burniewicz, 1996	Poland	Privatisation and liberalisation	Traffic Productivity Efficiency	Increases Increases Increases
Haffner and van Bergeijk, 1997	Netherlands	Liberalisation of cabotage, driving periods	Prices	Decline by 1%
Høj <i>et al.</i> , 1995	Australia	Liberalisation of entry and prices (1950 and 1960s)	Prices Quality	Decline Improves
	Canada	Liberalisation of entry and prices	Prices Quality	Decline Improves
	France	Liberalisation of entry and prices (1979 and 1989)	Prices	Decline
	New Zealand	Liberalisation of entry, services and prices (1983)	Quality	Improves
	Norway	Liberalisation of entry, services and prices (1987)	Entry	Positive
	Sweden	Liberalisation of entry (1964)	Entry	Positive
	United Kingdom	Liberalisation of entry, services and prices (1968)	Quality	Improves
Molnar, 1996	Hungary	Privatisation and liberalisation	Traffic Productivity Efficiency	Increases Increases Increases
McKinnon, 1996	United Kingdom (1987-1990)	Road haulage deregulation	Prices	Decline by 25%
	United States (1970-1978)			Decline by 12-25%
	New Zealand (1984-1987)			Decline by 25%
	France (1987-1990)			Decline by 15%
OECD, 1999a	United States	Liberalisation of entry and prices	Prices Efficiency Quality Employment	Decline by 75% (TL) and 35% (LTL) Increases Improves Increases by 16%

Table 3. **Product market liberalisation and performance** (cont.)

Author	Country/period	Explanatory variable	Performance variable	Effects found
OECD, 1999 ^b	Mexico	Liberalisation of entry and prices	Prices Quality Employment Efficiency	Decline by 37% Improves Increases by 5% Increases
OECD, 1999 ^c	Japan	Liberalisation of entry and prices	Entry Profit Prices Quality Productivity	Increases Increases Decline Improves Increases
Opletal-Ryba, 1996	Czech Republic	Impact of privatisation and liberalisation	Traffic Productivity Efficiency	Increases Increases Increases
Rose, 1987	United States	Labour rent sharing and regulation	Rent sharing	Declines
Winston, 1993	United States	Liberalisation of entry and prices	Consumer welfare	Gain of 16 billion of 1990 US\$
Winston, 1998	United States	Deregulation less than truckload trucking	Prices Efficiency Quality	Decline Increases Increases
		Deregulation truckload trucking	Prices Efficiency Quality	Decline Increases Increases
Yamauchi, 1995	Japan	Liberalisation of domestic road haulage	Consumer welfare	Gains between 2.5 billion and 8.2 billion of US\$
Ying, 1990	61 firms United States 1975-84	Deregulation	Technological progress Cost Productivity	Increases Declines Increases
Ying and Keeler, 1991	56 firms United States 1975-83	Liberalisation of entry and prices	Prices	Decline by 25% to 35%

Sources: See column 1.

In countries in which barriers to entry and restrictions on price competition had created rents for the employees of firms already in the market, these rents are tending to disappear (for the United States, see Rose, 1987; Boyer, 1991; Hirsch and MacPherson, 1998). This last fact could explain European road hauliers' fear that their working conditions would deteriorate when the road haulage market was opened fully on 1 July 1998.²⁹

CONCLUSIONS

The road freight industry has undergone sweeping changes in the past two decades, with a rapid growth of new forms of competition in both its truckload and less-than-truckload segments. In parallel, a growing number of OECD countries have recognised that regulations unduly restricting these competitive developments needed to be relaxed. Still, the pace and scale of liberalisation has varied widely from one country to another. The main remaining impediment to competition is the restrictive web of bilateral international and/or multilateral agreements that continue to impose discriminations on foreign hauliers. It is important to note, however, that regulations in both industries continue to evolve rapidly and, to some extent, the reported cross-country differences in regulatory approaches may have been reduced by reforms implemented after 1998, on which however only scattered information is available.

The available empirical evidence suggests that liberalisation has promoted efficiency and consumer welfare in the countries that have implemented reforms. None of the adverse consequences feared by the industry have happened: in reforming countries competition is thriving in a stable industry environment and safety levels have generally been improved. At the same time, freight rates have been reduced, productivity has been enhanced and innovative activity was stimulated.

The economic implications of differences in regulatory approaches, which are likely to shape industry structures and competitive developments across the OECD, deserve to be explored more fully in the future. To this end, viable comparative measures of economic performance in the road freight industry should be identified, a difficult task in view of the conceptual problems involved and the few data available at the international level.

NOTES

1. An extensive analysis of competition issues in the different segments of the road freight industry can be found in Biggar (2001).
2. See Nicoletti *et al.* (1999) and OECD (2000).
3. The shares are in total rail, road, inland waterways and pipeline freight transportation measured in tonne-kilometres. If domestic maritime transport (intra-Community for the European Union) is taken into account, the share of road haulage is smaller: 53 per cent for Japan, 44 per cent for the European Union and 26 per cent for the United States (EC, 2000). Large shares of road haulage in total transport can be partly associated with the low degree of efficiency of other transport modes (Italy), the lack of rail and inland waterways (Denmark, Greece and Japan), or topography (Greece) (EC, 1994). Similarly, small shares can be related to the distances involved (United States, Canada) or historical factors (Czech Republic, Poland).
4. Own-account transport accounts for 26 per cent of road freight haulage in EU countries and almost 45 per cent in the United States (Hamelin, 1999). In the past two decades both the number of employees and the number of tonne-kilometres transported in the own-account segment of the industry fell (Lawton-Smith 1995; ECMT, 1999*a*). The tendency for own-account operators to reduce their fleets is part of a general trend towards contracting out of non-essential activities, but the reduction in fleet size has also been stimulated by greater competition between road hauliers, the fall in costs and the improvement in quality that has resulted (EC, 1997; ECMT 1999*a*).
5. Biggar (2001) reports the results of several empirical studies, focusing on the US road freight industry, which confirm the different returns to scale faced by TL and LTL freight companies.
6. Data for Mexico may be affected by a large number of unreported small road freight businesses.
7. According to the OECD *International Regulation Database*, the market share held by the three largest transport undertakings for hire or reward (tonnes/kms) is as follows: 6 per cent in the Netherlands (1997), 5 per cent in Finland (1997, market share by turnover), 3.8 per cent in Canada (1995, in 1985 the three largest firms accounted for 7.2 per cent), Mexico (1993) and Portugal (1997), 1.5 per cent in France (1995, compared with 3.5 per cent in 1986) and close to 0 per cent in the United Kingdom and Japan (1997).
8. For example, in the European Union, the countries that have the busiest international hauliers are not those with the lowest payroll costs, but those with the most efficient firms.

9. The broad idea can be summarised as follows. To ensure that shippers in small communities are not deprived of transport services or obliged to pay higher rates than shippers in big towns, the best way of serving the general interest is to regulate the sector so that profitable routes cross-subsidise unprofitable ones (OECD, 1990).
10. The scale and extent of regulations continues to depend on several factors. First, the type of transport concerned (for hire or reward or own-account transport, national transport, international transport or transit haulage) and the company providing the transport (transport operator or otherwise, national or foreign haulier). Second, the size of the vehicle concerned (light or heavy goods vehicle) and the type of product it is carrying (dangerous product, livestock, fresh produce or other). For example, road freight haulage in light vehicles is covered by very few regulations (Defoug and Pfalzgraf, 1998).
11. Although driving time regulations are usually considered to be a form of regulation of traffic and vehicles, they are mentioned here because they can also affect the operation of the sector. For instance, international trade in road freight services can be affected by driving restrictions in third party countries that trucking companies need to cross. Similarly, innovations in the area of network organisation (such as the use of satellite tracking systems) may be hindered by the lack of driving time flexibility.
12. The information cited is from the OECD *International Regulation Database* and generally relates only to transport for hire or reward (regulations on own-account transport depend on the business sector in which the firm operates). Changes in the regulatory framework since 1998 are not taken into account.
13. In Germany, France, Italy, Belgium, Denmark, Portugal, the Czech Republic and Hungary, permits are issued for limited periods. In Austria, Canada and Greece, they are valid for only part of the country.
14. For an assessment of the burden of administrative formalities that have to be completed in order to start a business in OECD countries, see Nicoletti *et al.* (1999).
15. Foreign discrimination can also be relevant in island countries members of regional trade agreements and/or with intense traffic connections with neighbouring countries.
16. Cabotage is the possibility for hauliers to carry freight in a country of which they are not residents.
17. Freight transport to avoid an unladen return journey.
18. Even in the former centrally-planned economies. For example, private companies accounted for 99.5 per cent of the total number of transport undertakings in Poland and 99.9 per cent in the Czech Republic (Rydzkowski 1996). In Hungary, they accounted for 86 per cent of total in 1994 (Rydzkowski, 1996) and by 1998 there were no longer any road haulage companies in public ownership (OECD *International Regulation Database*).
19. In Turkey, the regulations do not apply to transit traffic.
20. In EU countries, Community legislation provides for a daily driving time of no more than 9 hours. In Japan, Turkey and Switzerland, the maximum driving time is also 9 hours. In Poland, the period is 8 hours.
21. For an analysis of the social aspects of road transport, see ECMT, 1999.
22. The indicators described in the next section retain the latter interpretation, with the participation of industry bodies in the definition of criteria for market access or price setting contributing to restrict competition.

23. When the data coverage was incomplete, interval estimates were obtained by using the minimum and then the maximum for the values that were missing.
24. The influence of the regulatory framework in Italy is also confirmed by Ponti (2000). Korea eliminated restrictive regulations only in 1999.
25. Despite NAFTA provisions, by mid-1999 no permits had yet been issued for Mexican firms wishing to engage in cross-border trucking (Fruin, 1999). Delays to the application of NAFTA to cross-border road freight were justified on grounds of unsatisfactory safety and security levels of Mexican trucking firms.
26. This survey does not cover the little evidence available on the effects of liberalisation on congestion, safety and pollution.
27. Of course this was also the result of concomitant improvements in standards and highways.
28. Part of the increase can also be explained by the indirect effects of implementation of the NAFTA.
29. See, for instance, EC (1998).

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