region. It is apparent that there are other factors equally or more important in successfully attracting industry to the region.

In the total sample, the transportation-related location factors ranked fourth (ROAD at 1014), sixth (RAIL at 880), eighth (SHIP at 706), twelfth (RATE at 464), and thirteenth (AIR at 84). The average of all the transportation location factors is 630, which, if taken as a single location factor, ranks transportation sixth out of nine location factors and is well below the grand sample mean of 769. If only the three major freight-carrying modes [trucking, rail, and marine (ROAD, RAIL, and SHIP)] are combined for a transportation location factor, which leaves out the air freight mode (AIR) and the subsidized freight rates (RATE) factors that rated very low, transportation still only ranks fifth at 867, behind RAW, OMR, MKT, and LAB.

In the period following World War II to the end of 1960, huge public investments in transportation infrastructure were made, particularly in the highway system. The air system also developed to serve the larger urban centers during this period. Four transportation modes became available to industry (i.e., trucking, rail, marine, and air) for moving their input materials and output products. However, the importance of transportation as a location factor, as indicated by the averaged index of the four modes, dropped significantly during this period to 700. During the period 1945-1969, transportation ranked fifth of 10 factors, behind RAW, OMR, MKT, and LAB.

In the recent period (since 1969), transportation investment has continued, and particular emphasis has been on the air mode and marine port facilities. However, the combined average index for the four transportation modes dropped further in importance to 542.

However, ROAD by itself ranked third during the post-World War II period, following GFA and LAB. The growing importance of the highway trucking mode of transportation in recent decades to Atlantic-region industry indicates that public funds would be best spent on highways and secondary and service roads. In fact, the difference between the importance of ROAD versus the other transportation modes is substantial enough to suggest that public capital expenditures on airport facilities, for instance, may have negative effects from the opportunity cost of not spending the funds on highways. This still does not mean, however, that good highways necessarily draw new industry, but the ROAD factor is certainly an important consideration to industry.

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Regulation of Road Haulage in United Kingdom: A Critical Review

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Road haulage is the dominant form of freight transportation in the United Kingdom. For a variety of economic and political reasons, it has been the subject of government control and regulation. Recently, public policy with regard to road haulage has come under review and there are signs that official attitudes toward the sector are changing. This paper looks at the ways in which road haulage is regulated in the United Kingdom and considers the economic justifications advanced in support of current policies. The effects of regulation are considered in some detail, although the extent to which this can be done satisfactorily is severely constrained by the paucity and inappropriateness of available data. The paper specifically questions the ways in which policy is formulated in the United Kingdom and looks at the three recent official studies of road haulage that, in turn, have reviewed pricing, licensing, and environmental issues. The United Kingdom's membership in the European Economic Community has, in recent years, introduced a new dimension into road-haulage policy formulation. The evolution of a Common Transport Policy has posed its own problems, as described in the last section of the paper.

In aggregate terms, road haulage dominates inland freight transportation in the United Kingdom. Between 1953 and 1979, the ton kilometers moved by road haulage more than tripled while its share of the total freight market nearly doubled. The increase was particularly rapid during the late 1950s and throughout the 1960s, but the rate of increase, although still pronounced, slowed down somewhat in the 1970s (see Table 1). Further growth in road freight traffic to the end of the decade is forecast (see Figure 1). This performance contrasts markedly, for example, with that of British Rail, which suffered both a relative and an absolute decline in its freight business over this period.

The increase in road-haulage ton kilometers is attributable, to a large extent, to a substantial rise in the average length of haul--from 35 km in 1953 to 69 km in 1979. This trend represents something of an encroachment into the longer-distance freight market, traditionally the domain of rail transportation. Another factor worthy of note is the greater use made of larger lorries; nationally, recent years have witnessed a fall in the ton kilometers moved by lighter classes of lorry and a rise in that done by lorries of more than 8-t unladen weight (uw). For example, in 1967 vehicles more than 8-t uw accounted for only 24 percent of the ton kilometers done by lorries but by 1979 this had

Table 1. Freight transportation in United Kingdom by mode.

Mode	Freight Ton Kilometers by Year (000 000 000s)					
	1970	1975	1976	1977	1978	1979
Road[a]	85.0	95.3	95.6	98.0	99.1	104.6
Rail[a]	26.8	20.9	20.6	20.1	20.0	19.9
Coastal shipping	23.2	18.3	20.0	23.2	27.1	20.0
Inland waterways	0.1	0.1	0.1	0.1	0.1	0.1
Pipelines	3.0	5.9	5.7	8.8	9.8	10.3
Total	138.1	140.5	142.0	150.2	156.1	154.9

[a]Road as a percentage of rail is as follows: for 1970, 76.0 percent; 1975, 82.0 percent; 1976, 82.3 percent; 1977, 83.0 percent; 1978, 83.2 percent; and 1979, 84.0 percent.

Figure 1. Forecast growth of road freight traffic in Great Britain to 2005.

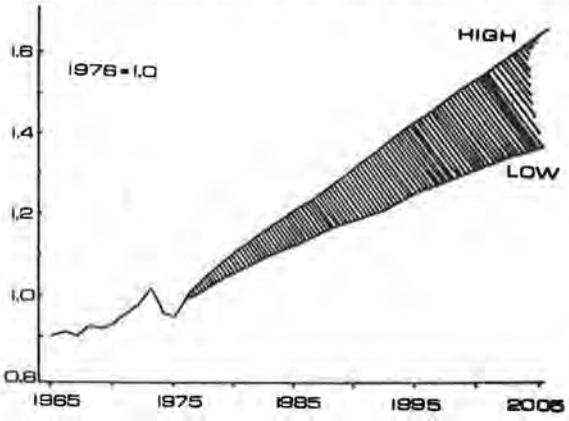

Table 2. Goods vehicles in United Kingdom by unladen weight.

Unladen Weight	Goods Vehicles (000s)				
	1970	1975	1976	1978[a]	1979[a]
Net ≤ 1.5 t					
< 16 cwt	391	434	438	405	411
> 16 cwt ≤ 1 t	174	191	182	195	216
> 1 t ≤ 1.5 t	410	531	544	553	583
Total	975	1156	1164	1153	1210
Net > 1.5 t					
> 1.5 t ≤ 2 t	71	78	68	63	69
> 2 t ≤ 3 t	136	137	135	116	111
> 3 t ≤ 5 t	244	169	156	142	148
> 5 t ≤ 8 t	135	138	132	118	119
> 8 t ≤ 10 t	40	57	59	55	56
> 10 t	15	39	44	56	65
Total	641	618	594	550	568
Total	1616	1774	1758	1703	1778

[a]Not strictly comparable with previous years.

risen by 76 percent. Put another way, more than two-thirds of all ton kilometers by road are now moved by lorries in excess of 24-t gross vehicle weight (gvw) and more than 90 percent by lorries of more than 16-t gvw. The increased importance of heavy lorries is reflected in the changed composition of the vehicle fleet (Table 2). Although there has been a marked rise in the number of small vans less than 1.5-t uw, the main trunk-haul fleet has been characterized by a steady fall in the number of lorries less than 5-t uw but a rise in those more than 8-t gvw; the latter now account for more than a fifth of the total road-haulage fleet. The result of this is that the total number of vehicles in the main fleet (i.e., more than 1.5-t uw) has actually declined by about 20 percent since 1967.

In addition to changes in the composition of the road-haulage fleet and the scale of its operations, there have been changes in the nature of the freight carried. We have already noted that the increased average length of haul contributed to the higher ton kilometers, but this must also be taken in the context of a fall in the actual total tonnage carried during recent years (from 1707 million t in 1968 to 1504 million t in 1979). There has been a marked shift away from bulk primary products (especially those associated with the mining, quarrying, and construction sectors of the economy) and a noticeable movement toward the carriage of final-product manufactures. The change reflects the evolving structure of the U.K. economy. Indeed, this changing structure has also contributed to the increased length of road haul, where economies of scale in manufacturing favor a greater geographical concentration of industry. (The average haul for crude minerals, ores, coal, coke, and building materials is much shorter than that associated with manufactures.)

Recent years have also seen changes in the type of haulage activities undertaken. Until the mid-1960s, the own-account (i.e., carriage of goods in connection with the business of the licensee) and hire-or-reward (i.e., exclusive carriage of another person's goods) sides of the road-haulage industry were more or less evenly balanced. Over the past 15 years or so, however, hire-or-reward operations have expanded more rapidly and now account for about 65 percent of the market, as shown in the table below [note that PH = public hauler (i.e., hire-or-reward) and OA = own account]:

Item	Haulage--Ton Kilometers by Year (000 000 000s)					
	1967	1969	1971	1973	1975	1977
Mainly PH	44.3	50	50.6	58.2	60.5	64.9
Mainly OA	30.2	33.4	35.3	32.2	34.8	33.1

(Note that PH as a percentage of the total is as follows: for 1967, 59.4 percent; 1969, 60.0 percent; 1971, 58.9 percent; 1973, 64.4 percent; 1975, 63.5 percent; and 1977, 62.2 percent.) Changes in licensing arrangements in the late 1960s seem likely to have exerted some influence, but the increasing costs of haulage operations are also likely to have acted as a constraint on the growth of own-account activities. International road haulage has also expanded considerably with a threefold increase in the number of lorries and trailers engaged in international journeys between 1971 and 1978.

It is against this general background that road freight transportation policy has been formulated in the United Kingdom. Of course, it must also be remembered that these policies have themselves played their part in shaping the trends. Investment in motorways (the system expanded from 153 km in 1960 to 2483 km in 1979) and improved trunk roads (there were 2768 km of dual carriageway in 1970, which rose to 4637 km in 1979) provided basic infrastructure for the sector and, insofar as faster but less-direct routes became available, contributed to the rise in the average length of haul. Increases in the permitted dimensions of vehicles in 1964 and 1968 (the current maximum width is 2.5 m and length is 15 m) and in maximum gross weight (which increased to 32.5 t for 4-axle articulated lorries in 1964 and 30 t for 4-axle rigid vehicles in 1972) have influenced the composition of the vehicle fleet. Similarly, changes in the licensing regulations in 1968 and, specifically, the termination of quantity controls in the hire-or-reward sector, seem likely to have accounted for some of the rapid growth in this type of operation. Membership of the

European Economic Community (EEC) from 1973, despite the apparent difficulties associated with formulating a Common Transport Policy (1), has stimulated the international dimension of road haulage.

EVOLUTION OF ROAD-HAULAGE POLICY

There is a long history of regulation associated with road haulage in the United Kingdom. Until comparatively recently, however, the dominant control was the system of licensing introduced as part of the Road and Rail Act of 1933, which limited entry to the industry. These quantity licensing arrangements were intended to provide a basis for fair competition between road and rail transportation. Legal restrictions since the 19th Century had limited the commercial freedom enjoyed by the railways and by the 1930s were preventing them from competing effectively against competition from road haulage. However, rather than permitting the railways greater freedom (and, incidentally, also as a means of protecting established road haulers), the policymakers of the 1930s attempted to create a balance by curtailing free entry into road haulage. The immediate effect of the Act was to reduce bankruptcies in road haulage and to increase the security enjoyed by existing operators. In the longer term, though, the underlying aim of protecting rail freight was not realized and the financial position of the privately owned railway companies continued to deteriorate. The road-haulage sector expanded, in part, because of the ease with which own-account (or C) licenses could be obtained and, in part, because of the changing structure and geographical distribution of U.K. industry.

Nationalization of long-distance road haulage in the post-World War II period was an attempt to improve the overall efficiency of freight transportation. Under the 1947 Transport Act, long-distance hire-or-reward haulage (i.e., more than 40 km) was placed under public ownership as British Road Services (BRS) and was combined with the newly nationalized railways, inland waterways, docks, and portions of the road passenger transportation sector under the umbrella of the British Transport Commission (BTC). Coordination of freight transportation, however, proved difficult and, in particular, the financial position of the railways continued to worsen. Three reasons for these problems can usefully be isolated.

1. Road haulage is essentially an atomistic industry that exhibits few managerial economies of scale. (In the relatively free-market situation of 1979, for instance, nearly 55 percent of operators had only one vehicle while 88 percent had five or less.) Many haulage activities rely on personal contacts and considerable dexterity and flexibility of management. A large nationalized undertaking, particularly if it is as highly centralized as BRS was in its early years, cannot offer the responsive and sensitive control that maximum efficiency demands.
2. The freedom left with own-account operators encouraged many potential customers to develop their own haulage activities rather than employ BRS or use the railways.
3. Within BTC there was a tendency for funds to be directed toward the road sector at the expense of the railways. BTC was given the remit to at least recover its costs and, despite its operational difficulties, BRS still offered a positive return, unlike the railways. The latter, after the massive disinvestment suffered during the war period--estimated at some £440 million in 1953 prices--was loss making.

BTC operated throughout with considerable financial difficulties and this resulted in a substantial denationalization of road haulage under the 1953 Transport Act. Part of road haulage, mainly that involving network services, remained in public hands, partly in response to the demands of those parts of the manufacturing industry that saw the need for a nationwide undertaking that could offer long-term, reliable contract services. The remainder of the industry was returned to the private sector and quantity licensing was retained to regulate entry. This situation remained, with some administrative amendments to the nationalized sector in 1962, until the 1968 Transport Act.

The 1968 Transport Act marked an important watershed in the regulation of road freight transportation. The Act rested on two important changes in emphasis. First, a political change was brought about by the return in 1964 of a Labor government committed to developing a comprehensive transportation policy that transcended individual modes (2). The keynote of the policy was controlled competition that, in the freight context, meant active and fair competition between alternative modes, limited only by the need to ensure adequate safety and environmental protection. Second, a committee looking specifically at road-haulage licensing reported in 1965 (3) and concluded that quantity restrictions did nothing to promote their stated objectives of ensuring public safety, reducing the harmful effects of road transportation on amenity, encouraging the greater use of rail facilities, or limiting traffic congestion. Further, it was argued that they reduced the internal efficiency of the industry by preventing more dynamic firms from entering and, also, by constraining the activities of haulers once licensed. In sum, the system was seen to be wasteful, ineffective, and unduly complicated and to be ill-designed to achieve its objectives. Competition and greater freedom of entry now became accepted aims of policy (4).

The 1968 Transport Act embodied these views and regulation of quantity gave way to the regulation of quality. (There were provisions to license heavy, long-distance public road haulage where competition exists with railways, on the grounds that consignors are often ignorant of relative overall costs or, at least, inert in the face of changing conditions, but this scheme was never actually impelemented.) Quality licensing was introduced to cover all forms of road haulage, irrespective of whether it was hire-or-reward or own account, which involved vehicles of more than 3.5-t plated weight or 30 hundredweight (cwt) net weight (smaller vehicles were completely freed from commercial licensing). The operator became required to satisfy the Licensing Authority that he or she has adequate facilities for maintenance, sufficient control over the loading of the vehicles, and adequate financial resources, and that he or she (or some senior employee) holds a manager's license. Safety standards had already been improved in the complementary 1967 Road Traffic Act, which laid down much more stringent standards for the testing of goods vehicles.

Existing regulations and controls are still based on the 1968 Transport Act, although there have been a number of technical changes as a result of membership in the EEC. For example, the EEC places its entire emphasis on the hire-or-reward sector and does not adopt the same comprehensive policy toward regulating road haulage as does the 1968 Act. Similarly, laws governing driving hours have been modified to correspond to EEC regulations, and mechanical monitoring of road-haulage operations by using tachographs has been accepted. These are, though, points of detail. The overall strategy of

controlled competition has been broadly accepted by the EEC since 1973, and a philosophy based on minimal regulation of road-haulage operators has prevailed.

EFFECTS OF REGULATION

Our understanding of the effectiveness of the various controls and regulations imposed on road freight transportation in the United Kingdom is extremely limited mainly because of the inadequacies of statistical information. The dearth of comprehensive and reliable data on the road-haulage sector was highlighted more than 20 years ago by Munby (5), who pointed to the lack of the most elementary information on haulage operations. Subsequently, improvements have been made but the incompleteness of the data still poses serious problems, not least because most of the information is of a physical, aggregate nature (e.g., dealing with vehicle stocks, tons transported, etc.) with few details of costs, profit margins, investment levels, etc. Recently, however, a number of official studies have generated new sources of information that permit us to conduct a rather more satisfactory assessment of the existing regulatory system. These studies are themselves partly a response to a widening concern about road transportation in the United Kingdom in general and also represent something of a monitoring by government of its own regulatory policies. Specifically, three studies are of central interest, which have considered, in turn, pricing (6), licensing (7), and the wider environmental impact of road haulage on the community (8). In addition, recent interest in improving road investment resulted in the establishment of an Advisory Committee on Trunk Road Assessment (9), which produced some limited information about the interaction between infrastructure provision and road freight transportation activities.

The success or otherwise of freight transportation regulation can be judged in two ways. First, are the regulations that currently exist ensuring efficient (in the widest sense) freight service provision? This basically requires an assessment of performance in the sector since the introduction of the new, minimal regulation regime in 1968. Second, are the specific instruments of regulation fulfilling their particular objectives (e.g., are driving-hour restrictions improving safety standards)? This is a particularly difficult question, since the various regulatory instruments have diverse effects and, second, they tend to interact with one another by either complementing or diluting their effectiveness. We intend to look at the first question briefly before spending rather more time in the following section on the second.

In commercial terms, road haulage has suffered serious financial difficulties since 1968. The survey of hire-or-reward haulers conducted jointly by the Price Commission (6) and the Foster Committee (7) indicates that, despite a fluctuating ratio of profits (net of interest) to net capital employed that ranged between about 8 and 20 percent (partly influenced by fleet size) between 1975 and 1977, if account is taken of the cost of capital replacement, a much dimmer picture emerges. For example, the adjustments suggest that an average negative real rate of return of -1 percent was earned in 1977 with only about a quarter of operators earning a reasonable positive return. More recent trends suggest that despite some picking up of business in the late 1970s (by about 17 percent in 1979), demand dropped significantly (by about 25 percent according to the Road Haulage Association) in 1980, thereby putting even greater financial pressures on operators. Despite these difficulties, it is not clear that the existing methods of regulation are the cause of the potential instability in the industry. First, haulage services satisfy a derived demand and the extreme severity of the recent recession in the economy is likely to have placed considerable strains on the sector, irrespective of the package of regulations that control it. Second, there is evidence, mainly in the form of bankruptcy statistics (7), that liquidations in the 1970s followed similar patterns to those in the 1960s (3). Thus, although it is difficult to define the appropriate counterfactual, there is little evidence that the post-1968 regime has resulted in increased instability in the sector. Many of the financial difficulties seem to result from factors external to the sector and not directly from the operational regulations.

There is also little evidence that the competitive situation since 1968 has resulted in a deterioration of the capital stock in the sector. The Foster Committee (7) reported a decline in the average age of the haulage fleet in 1977 following a period of slight increase. There was also a considerable restocking in 1979 with sales of more than 305 000 vehicles. Although the rather uneven age profile of the fleet makes it difficult to draw firm conclusions from this, the growth in the average size of vehicles does suggest that the overall effect is an improvement in the quality of the capital stock. It is also clear from the extensive second-hand market that competitive conditions do prevent excessive and wasteful nonprice competition from developing.

Turning from the internal efficiency of the haulage sector to the broader social and environmental issues, controlled competition accepts that the market offers the most efficient method of providing haulage services, conditional on the external consequences of haulage activities being controlled. Clearly, potential conflicts arise between official policymakers who wish to regulate road haulage in order to maximize overall social welfare and the haulage associations that are more interested in profit margins and financial costs. Details of the actual economic performance of road-haulage firms are difficult enough to obtain, but the subjective nature of many external effects makes assessment even more problematic. There is certainly evidence that in recent years environmental problems attributable to lorries have increased in certain places and in specific circumstances where there have been marked increases in the incidence of the largest and heaviest lorries. The Armitage report (8) concludes, however, that although improvements via regulatory changes are still necessary, there have been major improvements in vehicle design that, combined with the numerically smaller vehicle fleet, have contained (if not improved) the general situation.

INSTRUMENTS OF REGULATION

Although the overall picture that emerges may suggest that the regulations under the regime of controlled competition have not seriously impeded the operations of the road-haulage sector, it is worth looking in more detail at the individual instruments of control themselves. These may be subdivided under five broad headings.

Entry Regulations

Entry regulations embrace both controls on the operators that enter the market and regulations on the types of vehicles allowed to enter the road network. The relative freedom of entry to the

Table 3. Heaviest lorries permitted in EEC countries.

Country	Weight (t)			
	Single Axle	4 Axles	5 Axles	6 Axles
U.K. and Ireland	10.16	32.5	-	-
France	13	38	-	-
Belgium and Luxembourg	13	38/40[a]	-	-
Germany	10	36	38	-
Italy	12	40	44	-
Denmark	10	36	40/42[b]	44
Holland	10	36[c]	46[c]	50
EEC proposal	10/11[d]	35	40/42[b]	44

[a]Higher limit applies to road trains.
[b]Higher limit applies to 3-axle tractors pulling 2-axle trailers.
[c]The Dutch have no statutory limits apart from the 10-t axle and the 50-t total weight. Figures indicated for 4- and 5-axle vehicles are practical limits.
[d]Higher limit applies to driving axle. A 5 percent tolerance on individual axle weights is also proposed.

industry since 1968, subject only to the attainment of an operator's license (O license), seems to have resulted in some changes in the type of haulage that takes place. (In 1978, it should be pointed out, there were minor changes in the licensing system to conform to EEC regulations, but these do not substantially alter the argument.) The relative growth in hire-or-reward activities at the expense of the own-account operations highlighted above suggests that in freer market conditions more consignors' will opt for the public hauler rather than operate their own fleet. Public haulers can usually offer a wider range of services and are generally less expensive than own-account operators but do have the disadvantage of being outside the consignors' direct control. This would indicate an improvement in efficiency, especially since the range of options open to the consignor is wider.

Controls on the entry of different vehicle classes, however, seem to be much less efficient. To begin with, the existing regulations regarding loading and size seem to be both inappropriate and ineffectual, and they have serious repercussions for the environment, economic efficiency, and the public purse. Evidence of overloading, for instance, suggests a pronounced increase in the practice through the 1970s, where the percentage of axles more than 10 t has risen from 5.2 percent in 1973 to 11.8 percent in 1976 and the percentage more than 11 t has risen from 2.2 to 7.0 percent for the same period. More recent evidence from the M6 motorway near Birmingham collected by the Transport and Road Research Laboratory suggests that nearly half the drive axles of 32.5-t lorries were overweight. This situation has obvious implications for the degree of wear and tear inflicted on the road surface (10). It also implies that there is no genuine commitment to enforce the laws, although recently both the Foster (7) and Armitage (8) Committees have recommended much stronger enforcement. The former was particularly concerned about activities at off-peak periods (e.g., weekends).

The violation of the law raises a further question: Are the basic regulations appropriate? Certainly the weight regulations in the United Kingdom are, in most respects, rather more stringent than in other European countries (see Table 3). This, it is claimed, both pushes up the financial costs of operating a vehicle fleet and also imposes certain types of additional environmental costs on the community (mainly because a large fleet is required to carry any given volume of traffic). The Armitage Committee (8) took both of these arguments into account in recommending that the maximum permitted gross vehicle weight be increased to 44 t with supplementary rules governing axle loadings and vehicle dimensions. In particular, there seem to be substantial financial savings from such a change, as shown in the table below (note that for 38- and 40-t gvw, 4-axle vehicles--2 axles on tractor and 3 on semitrailer; for 42-t gvw, 5-axle vehicles--3 axles on tractor and 2 on semitrailer):

Vehicle	Savings (%)
35-t gvw, 4 axles	5-7
38-t gvw, 5 axles	5-9
40-t gvw, 5 axles	7-14
42-t gvw, 5 axles	9-13
44-t gvw, 6 axles	11-13

[There are more estimates for 40-t gvw, 5-axle vehicles than for others (i.e., 7-14 percent); most are in the range of 10-12 percent.] In the summer of 1981, however, the government rejected such a proposal mainly on the grounds of the potential infrastructure damage and also under pressure from environmentalist lobbies. It still seems likely, though, that some increase in maximum gross vehicle weight will take place, albeit at a lower level, and that enforcement of laws will be substantially tightened.

Operational Regulations

Once a hauler meets the entry requirements, his or her activities in the market are still restricted by operational rules (e.g., speed limits, route controls, etc.). These are essentially management regulations intended both to facilitate a smooth flow of traffic and to protect sensitive segments of the community. The geographical bluntness of the regulations, while not necessarily detracting from their overall function, often leaves specific problem areas. Attempts to specifically protect residential areas and concentrate traffic on lorry routes under the Dykes Act of 1973 (11), for example, combined with access controls and channeling of traffic within urban areas, have been attempted in the United Kingdom, but to date their success has been limited. One of the main difficulties is that there are few ideal routes on which to concentrate the goods traffic and, without very substantial investment, there is little hope that this situation will change (12). In many cases, channeling of traffic would only relieve some people from the nuisance of heavy lorries by inflicting a greater burden on others. A scheme proposed for Birmingham, for example, while benefiting 60 percent of houses in the affected area would be detrimental to the other 40 percent. This problem is recognized by official policymakers (13) and has been highlighted in the Armitage study (8). The latter report, indeed, seems to be indicating a policy of insulation and protection for those areas adversely affected by lorry movements in its lorry action area program rather than the adoption of more stringent regulations on vehicle use.

Financial Regulations

Vehicle and fuel taxation regulate both the overall composition of the haulage fleet and the kilometers run by individual vehicles. Although there is a substantial difference in the amounts of taxation paid by the various categories of vehicles, it is less certain that all pay a sufficient amount to cover their allocated road track costs (14) and their community cost. In addition, it is not clear that the method of financial regulation, which has a substantial fixed payment in the form of annual

vehicle excise duty (the so-called road fund license), offers the appropriate inducement to make efficient use of road space. Once a license has been purchased, the relatively low fuel taxation is unlikely to encourage economy in the use made of that vehicle. In addition, since the fixed component of charges rises relatively slowly with vehicle size and the variable component (mainly fuel duty) in most circumstances increases less than in proportion to the ton kilometers of capacity obtained by operating the vehicle, there is also a bias that favors the adoption of larger vehicles. Consequently, the financial regulations, although in aggregate yielding revenue sufficient to recover the costs of road provision, may lead to some distortions by virtue of the ways in which charges are levied. Unfortunately, political and technical problems seem to make it difficult to transfer the main incidence of taxation from the fixed to the variable component.

Commercial Regulations

The main commercial regulations in road haulage relate to controlling rates charged to consignors, and at times since 1968 there have been attempts to regulate haulage charges as a tool in national macroeconomic (normally anti-inflation) policy. For example, the Price Commission (6) reported in 1978: "Apart from certain increases for individual firms which may be justified by higher provision for depreciation, in the economic circumstances now ruling, including recent stabilization of oil prices, we would expect to see only a very modest increase in charges over the next twelve months, certainly not above the rate of inflation currently prevailing in the economy generally." The difficulty in regulating road-haulage charges is that revenue in the sector is extremely sensitive to demand unless there is adequate flexibility in pricing. The pressure to regulate charges normally occurs at times of depression in the haulage sector, when capacity is abundant but consignments few. Hence, there is only limited scope for greater productivity and, indeed, the efforts to obtain more consignments may actually push up costs, putting additional strains on margins. Thus it seems strange that the Price Commission (6) recommended regulating charges in the late 1970s when much of their evidence pointed to depressed profits and a relatively efficient industry with minimal scope for price cutting.

To digress slightly, the suggestion of the Price Commission also serves a further purpose, namely, to illustrate one of the major shortcomings of the committee-of-inquiry system as operated in the United Kingdom. At the same time the Price Commission undertook its study into pricing, the Foster Committee (7) was concerning itself independently with entry regulations. Accepting the basic economic premise that price and quantity are codetermined, this must lead to serious doubts about the validity of the two exercises; it is impossible to devise policies on pricing without ipso facto determining the level of output in the sector.

Infrastructure Provision

In the broadest sense, the road-haulage sector is regulated by the infrastructure provided for its use. Over recent years, the U.K. government has placed high priority on directing road investment to places that facilitate easy movement of road haulage to the major ports and to schemes that take interurban freight traffic away from sensitive urban and rural areas. The aggregate provision of road investment also influences the ability of road haulage to compete with rail freight services. The difficulty with this long-term method of regulation is that it is extremely sensitive to economic conditions and policies not directly connected with road-haulage activities. The scale and nature of road investment programs are continually subjected to change to meet macroeconomic policy objectives (e.g., the reductions in the level of public sector spending since 1978 were designed mainly to keep government borrowing down). The link between policymaking and regulation at the microlevel (which is the main concern of road haulers) and the same factors at the macrolevel is often rather weak and ill-defined.

UNITED KINGDOM REGULATIONS AND THE EEC

Britain's membership in the EEC since 1973 has resulted in a number of major impacts on U.K. freight transportation (15-17). First, it means that U.K. operators are now subject to the same rules and restrictions as other operators within the EEC. This applies particularly to driving hours, licensing arrangements, and the use of tachographs but does not, as yet, apply to vehicle weights or taxation, although this seems likely to change in the near future. Second, it provides haulers with a larger potential market in which to offer their services, and there has been a gradual (albeit very slow) relaxation of the old established bilateral licensing system as an EEC quota of European licenses has become available. Of course, this also means increased competition from overseas haulers that operate into the United Kingdom, although cabotage is still not permitted. Third, limited finance is now available via agencies such as the Regional Development Fund to improve transportation infrastructure. Quite clearly, the ways in which such funds are used within the United Kingdom are likely to influence the relative competitiveness of road and rail freight transportation (18).

The formulation of EEC transportation policy and the associated regulation of the road-haulage sector in itself pose serious problems, not least because of the different philosophies favored by the various member states. Holland and the United Kingdom, for example, tend to pursue a broadly commercial approach to freight transportation and are liberal in their treatment of the road-haulage sector. In contrast, France and Germany, adopting a protective posture toward their railways, have traditionally favored entry controls into road haulage and have operated rigid quantity licensing regimes. The European Coal and Steel Community (ECSC) laid the foundation for a Common Transport Policy in the 1950s but was almost exclusively concerned with rail freight transportation and, in particular, the movement of bulk primary commodities (19). Nevertheless, the ECSC did establish the principle that a common policy with respect to transportation formed a necessary component of any free-trade area. The Treaty of Rome, which established the EEC, therefore contains a specific remit--one of only two such remits in the Treaty--on the formulation of a Common Transport Policy (i.e., "The activity of the Community [is to include]...the adoption of a common policy in the sphere of transport"). The guiding principle is the gradual introduction of consistent arrangements in line with social and economic requirements and promoting a sound development of the transportation industry itself. The transportation market must be organized in accordance with the generally recognized principles of the market economy, although public intervention is not precluded for reasons of overriding importance. Quite

clearly, this general set of aims is not inconsistent with the types of road-haulage regulation policies pursued in the United Kingdom since 1968.

Although the general principles of regulation are consistent, the types of actual and proposed regulations (by the Commission of the EEC) for the EEC before 1973 conflicted seriously with those in force in the United Kingdom. By this one does not mean simply details of regulations (e.g., length of driving hours, maximum weight of vehicles, use of mechanical recording devices, etc.), which were almost inevitably different, but rather the approach to entry to the market, control of rates, and licensing regimes. Prior to 1973 the Commission of the EEC, in a series of reports, advocated and, to a much more limited extent, achieved a policy of operational regulation and control (20,21). Controls on prices, for instance, were proposed and introduced on an experimental basis; haulers were only permitted to charge within a predetermined fork or bracket of 23 percent. Licensing was restricted to hire-or-reward activities with proposals that operators over long distance be subjected to quantity controls on a zonal basis (22). For a variety of reasons, operational controls of this kind have proved unsuccessful. They are extremely difficult to set at an appropriate level and to enforce. Further, since they are bureaucratic in nature, they tend to be inflexible and insensitive to changing market conditions.

Since 1973 and the enlargement of the EEC following the membership of the United Kingdom, Denmark, and Eire, there has been a new impetus (23) to the Common Transport Policy. Attention has been directed and focused away from unimodal attempts at detailed regulation of individual modes of freight transportation and has instead turned to ideas of a more general supervision of capacity along with much greater emphasis on harmonizing infrastructure investment and pricing. However, policy has still been slow to evolve and, for example, ideas of expanding the quota of EEC licenses have been thwarted by disagreements between member states (some 95 percent of community trade is still carried under bilateral agreements). One of the main difficulties is that it is unclear from the Treaty of Rome where the boundaries of regulatory responsibility lie between the powers of national governments and the EEC Commission [see paper by Gwilliam (24) for a much more detailed discussion of this institutional problem]. Additional problems arise because transportation is but one concern of the EEC and frequently, for reasons of national political interest, policies in the transportation sphere are used in "horse trading" that involves other areas of EEC interest. Schemes put forward by the Commission are subjected to lengthy discussions by the Council of Ministers with the result that they are rejected or emerge in an entirely different, compromised form. It is also apparent that within the EEC the majority of members view transportation policy not as an end in itself but as an instrument for achieving the wider economic and political objectives of the EEC. This contrasts with the U.K. approach, which has traditionally centered on maximizing, in the widest sense, efficiency within the transportation sector, and, in consequence, areas of conflict in purpose have arisen.

CONCLUSIONS

The regulation of road haulage in the United Kingdom has broadly achieved its objectives but, within this overall picture, there are question marks hanging over the efficiency with which some of the tools of regulation have been applied. One of the major problems centers around the lack of regular and consistent monitoring of the economic performance of the sector and the inadequacy of research effort into the environmental and social impact of road haulage on the community. The system of periodic reviews by ad hoc committees is an extremely poor method of gathering information and formulating ideas regarding the effectiveness of regulatory policy. To date, the EEC Common Transport Policy has had only minimal effects on the internal control of the sector, and where regulations have been imposed they have generally involved points of detail rather than points of substance.

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Reaction to Rail Transportation Deregulation by U.S. Dry Pea and Lentil Industry

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Significant deregulation of transportation modes has occurred in recent times. Most studies thus far have been only theoretical or conjectural in nature. The results of an empirical study of the impact on the dry pea and lentil industry from the deregulation of rail transportation that occurred over 18 months ago are reported. Methodologically, the marketing bill was decomposed into a market effect, rate effect, and joint effect. All of the processors of dry peas and lentils were surveyed. It was found that rail rates increased to all destinations after deregulation, but to a smaller degree than anticipated by shippers. This was due mainly to railroads changing rate quotas from a per hundredweight basis to a per car basis and shippers responding by loading cars heavier. This allowed railroads to move more tonnage with fewer cars, thus increasing efficiency. Railroads emphasized long-haul movement to the Gulf and East regions while motor and water carriers took over most of the short-haul movement. Cancellation of rail transit privileges directly impacted on those regions that had relied on this privilege for assemblying peas and lentils for processing. Finally, changes in marketing patterns had a far larger impact on the shipping bill than rate changes due to deregulation. Rates increased modestly, especially for long-distance movement.

Whether it be called deregulation or reregulation, it is obvious that significant changes in transportation regulation have occurred in recent years. Waterways, railroads, and motor carriers have all experienced modifications in the rules and regulations that affect their costs and operational alternatives.

The Motor Carrier Act of 1980 offered new exemptions in agricultural carriage, made entry into the industry significantly easier, and effectively eliminated the ratemaking of motor carriers by collective action. The Staggers Rail Act of 1980 increased carrier flexibility in rail rates and in contracting, increased Interstate Commerce Commission (ICC) exempt commodity groups, and also constrained collective railroad ratemaking. The water carriers had been previously affected by the user tax provisions of the Inland Waterways Revenue Act of 1978. Proposed legislation may increase the level and impact of this user fee on the waterways of the nation. The Airline Deregulation Act of 1978 will totally eliminate the control of the Civil Aeronautics Board (CAB) over what once was a highly regulated industry.

The evaluation of these regulatory reforms is currently under way but, with the exception of the airline deregulation experience, few studies have been completed at this time, due primarily to the lack of time since regulatory changes have occurred and the accompanying lack of data. Most studies have been national in scope and conjectural in analysis.

However, an opportunity to evaluate rail deregulation is available since dry peas and lentils were freed from ICC economic regulation in summer 1980. This deregulation, in Ex Parte 346, allowed railroads to offer any service at whatever rate they desired. In addition to the direct effect on the railroads, other modes of transportation were indirectly affected by the change because of an altered competitive environment (peas and lentils had been previously exempt when moved by motor carrier or barge) and also because railroad rates and services had been historically used as a standard for rate setting by alternative modes. The rail regulation made possible an in-depth analysis of an individual commodity so that specific empirical, rather than theoretical, interrelations and actual modal reactions could be identified.

BACKGROUND

Objectives

The overall purpose of this paper is to identify the impacts of rail regulatory reform on the dry pea and lentil industry in the United States. In order to achieve this purpose, the specific objectives are to (a) identify the transportation characteristics of dry peas and lentils, (b) identify modal reaction to deregulation, and (c) identify the responses of dry pea and lentil shippers to these transportation changes.

Study Area

Essentially 100 percent of the dry peas and lentils grown in the United States are grown in the study area of eastern Washington, northern Idaho, and northeastern Oregon. Growers use dry peas and lentils as alternative rotation crops to cereals.