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IMPACTS ON AGRICULTURE OF
DEREGULATING THE TRANSPORTATION SYSTEM

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The term "deregulation," used in reference to surface transportation, is a useful, one-word slogan representing a significant increase in commercial freedom for the transportation industries. However, the term does not imply an institutional shift from the current, regulated, common carrier structure to a completely unregulated, competitive market structure. When constructing the Staggers Rail Act of 1980 and the Motor Carrier Act of 1980, Congress had no intention to terminate surface transportation regulation. The intent was to loosen the grip of government rules, allowing carriers and shippers to respond more fully to opportunities available in an increasingly competitive market environment.

The purpose of this paper is to assess the likely effects of transportation regulatory reform on transportation opportunities of agricultural shippers and rural communities. This purpose requires consideration of four topics: a) the existing common carrier structure being changed, b) criteria for maintaining economic regulations, c) tests of agricultural transportation markets against the criteria for regulation and d) the legislated regulatory changes. This approach also will provide implications for the effects on agriculture of complete transportation deregulation.

The Common Carrier Heritage

Transport regulation in the United States developed along with public utility regulation. A public utility is considered an "essential" industry with a tendency toward monopoly. As such, utilities are

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publicly sanctioned and supported as virtual monopolies, protected from competitors in return for public-spirited service.

The public utility approach has created a transportation system based on the common carrier, including all railroads and most for-hire motor carriers. Common carriers receive the privilege to operate in return for fulfilling four basic duties: a) to carry all goods and persons offered within the limits of carrier facilities, b) to provide for safe delivery, c) to treat all customers without discrimination and d) to charge "reasonable" rates. Public sanction requires a certificate of public convenience and necessity to begin, cease or change transport services. The certificate purports to represent notice that an applicant for authority to haul is fit, willing and able to perform the proposed services and that the public convenience and necessity demand the change in service. Common carrier duties require that carriers assume full liability for freight loss and damage and that carriers present rate proposals and defenses on discrimination charges for regulatory review.

The common carrier structure is charged with raising rate levels above cost, distorting relative transport rates, creating associated resource waste and yielding miserably low productivity growth in the transportation industries (e.g., Caves, et al.; Friedlaender; Levin, 1978; Moore; Spann and Erickson; Stigler). However, proponents of regulation anticipate monopoly abuses in a free market structure. Criteria for maintaining regulations are discussed next to provide a test of these conflicting views.

Criteria for Regulation

Regulation is the exercise by the state of the power to prohibit or compel actions by persons or firms.

Three theories have been developed inductively to explain why the state exercises regulatory powers. First, the public interest theory suggests that the state intervenes to protect the public from market power. Secondly, the public finance theory argues that the state finances "worth-while" projects through cross-subsidy where the market would otherwise fail (Posner). Thus, criteria for maintaining transport regulation are to be found in market power and market failure.

A third theory, capture theory, states that rent-seeking industries capture the coercive power of the state to protect cartel arrangements, i.e., to protect market power (Buchanan; Stigler). Capture theory is important because railroads and motor carriers have been identified as cartels protected by regulation (Moore; Spann and Erickson; Stigler). However, the theory offers no criteria for maintaining regulations.

Market Power

Market Power in transportation may arise when only one feasible shipment alternative is available. This may occur in industries with decreasing long-run average costs where consolidations are continually justified or when traffic volume will support only one carrier, leaving shippers captive to that carrier (Seneca). Thus, criteria for regulation of market power are two: a) evidence of decreasing long-run average cost over the relevant output range of transportation industries and b) a lack of more than one shipper alternative for a significant number of shippers in the long run.

First, the decreasing cost hypothesis can be ruled out. Trucking has been shown to be a slightly increasing cost industry after accounting for capacity utilization factors (Koenker; Moore; Spady and Friedlaender).

The minimum average cost of operation lies at an annual output level near six to eight million ton-miles, suggesting economy in trucking firms with 2 to 5 tractor-trailers. Economies in trucking come not from firm size but from the capacity utilization achieved with longer hauls and heavier loads. Strictly limited entry has left acquisition and merger as the only viable means to achieve longer hauls, thereby forcing mergers beyond efficient firm size to achieve economies of utilization (Spady and Friedlaender).

Whether railroading is a decreasing or constant cost industry is unclear from empirical studies (Harris). However, Spann and Erickson have shown that railroad firm behavior prior to the Interstate Commerce Act was not representative of a decreasing cost industry. Also, a recent empirical study reveals that railroads, like trucks, have an average cost which is largely determined by capacity utilization factors (Harris). Traffic density is a major determinant of average cost; operating a given amount of traffic over a larger network raises average cost.

While the decreasing cost criterion for regulation can be discarded, cost studies show clear efficiencies in capacity utilization. One should look for impediments to capacity utilization which represent barriers to achieving least-cost operations.

The second potential source of monopoly power is where either traffic density is low enough to support only one feasible carrier or access to more than one carrier is restricted. This is the "captive shipper" problem considered critical by some (Shaffer; Breimyer). The criterion for regulation in this case is the competitiveness of transportation alternatives. Competition is the lack of supplier control over price and

is reflected in price elasticity of demand for freight services faced by particular transport firms.

Market Failure

The second motivation for regulation is to prevent market failure. This may occur if transportation is largely a public good or if transportation markets yield externalities.

Public goods are those which are nonexclusive in consumption and have zero marginal cost of production. Highways and waterways have problems with exclusion. But this is a user charge and taxation issue. There is no problem excluding shippers from the means of conveyance. The zero marginal cost criterion of public goods also is not realistic in transportation. Marginal cost in operations would be zero only in the case of persistent excess capacity, which would not occur in an uninhibited market (Johnson and Pasour). Thus, the public good criterion for regulation is irrelevant for the operating segments of transportation industries.

Externalities might be another source of market failure where transportation influences are: a) beyond the direct concern of carriers and shippers and b) incapable of being accounted for by side contracts between carriers and indirectly affected consumers. Examples given of transportation externalities include local economic development potential, population settlement patterns, fuel conservation and employment effects (Shaffer). The cross-subsidy approach to handling externalities involves two problems: a) identification of a true externality and b) the relative ability of a centralized agency to perceive costs and preferences.

Identification of a true, Pareto-relevant externality is not possible if one accepts the reality that transaction costs are nonzero in contract negotiation (Dahlman). Access to the ability to bargain allows carriers and consumers of indirect transportation products to consider the benefits and costs of a contract which would internalize the effects, e.g., a state highway department subsidizing a rail branch line to prevent road deterioration anticipated with traffic diversion to trucks. If the parties are free to negotiate and a contract is not struck, this implies not the persistence of externality but the inadequacy of anticipated benefits to cover anticipated costs of negotiation and carrying out a contract. Parties may make mistakes due to imperfect information, but this is a part of the entrepreneurial decision process. For an outside observer to identify a no-contract situation as evidence of persistent Pareto-relevant externality is to say that the outside observer thinks he knows more about the risks, opportunity costs and preferences of the participants than the participants themselves do. The roles of government are to establish initial rights and to insure the ability to bargain.

If the inability to identify externality were not enough, consider the relative ability of a central authority to accumulate enough information to solve one if found. A central authority must undertake considerable investigations to understand the situation and the interests involved in an indirect products case, and even then, be left incapable of accurately estimating opportunity costs and preferences (Hayek, p. 524). Also, having to start each case without prior knowledge of specific, local circumstances makes it difficult for a central authority

to render timely decisions which permit rapid adaptation to constantly changing market environments.

The criterion for regulation to prevent market failure is the presence of market restrictions on bargaining between carriers and non-shippers. When bargaining is prevented, externalities may persist even in the presence of low transaction and operational costs.

The Criteria Applied to Agriculture

Three criteria for regulation have surfaced in the preceding discussion: a) impediments to capacity utilization, b) competitiveness of transportation alternatives, and c) restrictions on bargaining. Agricultural transportation markets can be evaluated against these criteria by mode of transport. Opponents of "deregulation" have supplied two hypotheses: a) that market barriers to entry and capacity utilization will leave rural communities without adequate truck service and b) that insufficient competitive shipper alternatives exist to protect agricultural communities from railroad monopoly behavior.

Rural Truck Service

There is evidence that rural communities are being served rather well by trucking services in spite of, rather than because of common carrier obligations and that market barriers to entry and capacity utilization are not as great as regulatory barriers. The experience of temporarily exempting fresh dressed and frozen poultry and frozen fruits and vegetables from truck regulation during the 1950s is an exemplary controlled experiment on the price effects of "deregulation" (reported in Moore, p. 59). During the period of exemption, truck rates on fresh poultry, frozen poultry and frozen fruits and vegetables dipped an

average 33 percent, 36 percent and 19 percent, respectively. A recent survey of the exempt livestock trucking industry shows that service prices are very near USDA budgeted cost estimates (Hoffman, et al.). Despite near-cost prices, these firms had the following characteristics: an average life of 18 years, average capacity utilization in a seasonal business of 94,000 miles per year per vehicle and an economic average firm size of 5 tractor-trailers.

Free entry of firms into an industry encourages a competitive environment which affects service quality as well as prices. A recent survey of livestock shippers shows that shippers are generally complimentary of service quality; only 20 percent of the market has gone to private carriage (Boles). Based on several survey studies, Allen concludes that the quality of less-than-load service to rural communities is due chiefly to the fill-in services of the United Parcel Service and contract and private carriage rather than to the fulfillment of common carrier service obligations.

There appear to be neither economic nor marketing advantages which would give large, national carriers an advantage over local carriers in providing local, rural transportation services. In fact, free entry and removal of specific authority restrictions on commodities, routes and service points will tend to create lower general rates, a broader variety of rate-service alternatives responsive to shippers' specific logistical demands and enhanced capacity utilization (Johnson and Tyng; U.S. Senate, pp. 124-128).

Rural Rail Competition

The public interest view holds that railroads are regulated to

prevent abuse from monopolistic practices. However, five categories of empirical studies provide strong evidence that there are close substitutes for the services of particular railroad companies, providing both intermodal and intramodal competition. These studies relate to evaluations of: a) rail line abandonments, b) seasonal railroad rates, c) rail-barge competition, d) fresh fruit and vegetable rail demand and e) inter-railroad competition.

The first group of studies evaluates the effects of rail abandonments on the grain economies of the Midwest and the Plains (Baumel, et al.; Berglund and Anderson; Johnson; Larson and Kane; Tyrchniewicz and Tosterud). Although in a few cases portions of lines studied are marginally viable, the maximum abandonment alternative is usually the most efficient because there are less costly transportation alternatives. These alternatives include trucking, truck-rail and truck-barge combinations and truck assembly at subterminals for subsequent unit-train shipment. These studies suggest that on rail lines of low density, cross-subsidy inherent in rail maintenance is the only force inhibiting economic adjustment of the grain collection and fertilizer distribution system. In fact, there is evidence that removal of regulatory protection on lines can stimulate adjustment and growth (Miller, et al.).

Seasonal railroad rate feasibility studies, conducted in Oklahoma and North Dakota, found that grain traffic would not be smoothed by seasonal rates because shipment alternatives did not permit rail rates to rise sufficiently to encourage additional storage construction. (Shouse and Johnson; Wilson, et al.). Both studies assume historical elevator patronage and uniform rail rate increases, prohibiting

consideration of inter-railroad competition. In Oklahoma, localized own-price elasticities of demand for rail services during the harvest period ranged from -1.02 to -3.7 (Shouse and Johnson, p. 23). In North Dakota, regional railroad demand is inelastic (-0.629) with an elastic cross-price relationship with truck service (Wilson, et al., pp. 37-39).

Railroad-barge competition is effective over a broad territory. The truck-barge alternative offers competitive rates (equal or below rail rates) for wheat shipment from the entire state of Kansas, except for the southwestern counties (Babcock; Johnson and Mennem). Barge competition also effectively limits rail rate increases for Kansas wheat moving to eastern flour mills and truck competition limits rail rate increases for Kansas flour to numerous consumer markets (Babcock). In the Pacific Northwest, the price elasticity of truck-barge grain demand is estimated to range from -1.27 to -5.20 and cross-elasticities of truck-barge demand with respect to rail rates are estimated to range from 1.46 to 5.30 (Logsdon).

Fruit and vegetable transportation studies on the West Coast also support the contention that competitive transportation alternatives exist for agricultural commodities. Truck and rail services demanded for movements of western fresh cherries and apples have modal demands which are own-price elastic with mutual cross-price elasticities with other modes which are positive and greater than unity (Miklius, et al.). Early evidence on the effects of exempting fresh fruits and vegetables from rail regulation two years ago, shows that rail rates fell, rail volume and market share increased and considerable railroad management activity has been devoted to creating rate-service options to compete in the cross-country

fresh produce transport market (Manalytics, Inc.).

The last group of studies is the most convincing in support of the hypothesis that railroads face substantial competition in rural transport markets. A simulation of "deregulation" strategies applied to 1972 conditions and rates reveals the power of inter-railroad competition to limit rail rate increases on agricultural products in the absence of maximum rate regulation (Levin, 1981 a, b). If rate restraints were removed without dismantling collective ratemaking, rail rates on field crops would climb 40 to 80 percent and produce rates would rise slightly. However, with a moderate degree of inter-railroad competition, field crop rates would fall slightly and produce rates would plummet.

Two localized investigations reinforce the power of inter-railroad competition to limit rail rate increases without regulation. Fuller and Shanmugham observe the effects of rail rate increases for wheat in western Kansas, Oklahoma and Texas. When all railroads raise their rates simultaneously by 10 percent, arc price elasticities of demand for rail service in five subregions range from 0.0 to -4.4 (-1.47 for the region). However, when only the dominant railroad raises rates by 10 percent while other railroads and trucks hold rates and facilities constant, the own-price elasticity of demand for the dominant carrier ranges from -1.2 to -8.7 (-5.6 for the region); cross-elasticities with respect to other railroad carriers range from 1.7 to 3.8 (2.9 for the region). In the long run, when river and port storage facilities can be expanded, a 10 percent rail rate hike would remove railroads from the market.

Case studies for corn and soybeans in eastern and western Iowa yield similar results (Miller, et al.). When corn and soybeans are kept

on the farm for marketing flexibility and all railroads raise rates 20 percent, farmer cost increases 6.8 cents per bushel in western Iowa and 3.6 cents per bushel in eastern Iowa. But when only the dominant carrier raises rates 20 percent while other railroads do not change rates, farmer cost increases are only 2.0 cents per bushel in the west and 0.7 cents per bushel in the east. In the latter case, own-price elasticity of demand for the dominant carrier is -4.0 in both Iowa regions and cross-price elasticities with respect to other railroads are 7.0 in the west and 3.5 in the east. The Iowa study suggests that with a flexible marketing strategy, farmers have the capacity to deliver grain to elevators located on railroads with the best rates. This is the source of inter-railroad competition.

The preceding summary of evidence, generated in numerous independent investigations using a variety of analytical methods leads to the following conclusions regarding the criteria for regulation:

- Internal firm cost economies provide strong incentives toward maximum capacity utilization;
- Competitively price alternatives to local rail carrier service are broadly available.

There likely will be specific instances where service will diminish in small communities and rail shippers will have to cease operations. However, there appears to be no strong evidence to justify maintenance of pervasive transportation regulation for agriculture. Specific complaints of monopoly behavior or discrimination can still be taken to the ICC, the Department of Justice or the court system.

Regulatory Reforms

Preparations are now complete to evaluate the effects of transportation regulatory reform on rural communities. Regulatory reforms in transportation are chiefly contained in the Railroad Revitalization and Regulatory Reform Act of 1976 (4-R Act), the Staggers Rail Act of 1980, the Motor Carrier Act of 1980 and various initiatives of the ICC.

Motor Carriers

The Motor Carrier Act of 1980 focuses on reducing regulatory entry barriers. The Act directs the ICC to streamline the common carrier certification process and to ease the criteria for approval. Fully certificated carriers must prove themselves "fit, willing and able" to serve and that they will serve a "useful public purpose," presumably much less strict than the "public convenience and necessity" standard. Protestors must be directly involved in the type of carriage proposed and evidence of potential traffic diversion from existing carriers is no longer sufficient to prevent entry. Under expedited procedures, existing carriers can expand their authority to cover more commodities, intermediate delivery points, round-trip routing and larger territories; many specific routing and gateway restrictions are to be removed immediately. Mixing of contract and common carrier loads and exempt and regulated commodities in the same load is permitted to add loading flexibility.

Three motor carrier entry provisions are especially important for agriculture. First, cooperatives can haul up to 25 percent of tonnage from nonmember, nonexempt commodities, instead of 15 percent, which improves backhaul potential. Secondly, more agricultural inputs have been exempted from regulation, including animal by-products not for human

consumption, livestock and poultry feed and agricultural seeds and plants. Third, a new class of "fitness only" carriers has been established for those performing the following services: a) serving a town recently losing a railroad or not served by a regular carrier, b) hauling government property, c) hauling small packaged freight and d) owner-operators hauling food products, agricultural limestone and soil conditioners and agricultural fertilizer. These services are presumed to fulfill the "useful public purpose" criterion and applications will be reviewed only on the merits of the carriers' fitness to serve these functions. All three provisions provide flexibility for exempt and cooperative haulers to extend their seasons of operation and to organize backhauls to the country.

Previously, evidence suggested no appreciable market barriers to motor carrier entry or capacity utilization. New regulatory rules greatly reduce regulatory barriers to entry and capacity utilization. Now all classes of truckers can apply for, and expect to be granted, authority to haul the traffic for which they can compete in the market. City to country backhaul potential is much improved, especially for exempt haulers, with relaxation of access to food, feed and fertilizer. Since truck costs are so sensitive to capacity utilization, eased entry can be expected to reduce trucking costs. Access to traffic and lower trucking costs will enhance competitiveness within the agricultural trucking industry and place lower rate ceilings on railroads.

Railroads

The Staggers Rail Act of 1980 focuses on railroad pricing flexibility and protection of bargaining channels. The Act sets a minimum

rate standard at variable cost and limits ICC jurisdiction on maximum rates to those cases where the railroad has "market dominance." A rate falling below a rate-to-variable-cost ratio threshold is sufficient to show a lack of market dominance. In shipper-initiated complaints, the burden of proof is on the shipper. Consequently, railroads are currently free to adjust rates in a considerable band. In addition, limited liability rates and rate premiums for special car services provide flexibility to construct rate-service options. Rate flexibility provisions already have been used to lower short-haul rates to meet truck competition and to lower long-haul rates for grain.

Three provisions are especially important for agriculture. First, two classes of carriage previously available to motor and water carriers are formally recognized for railroads: exempt and contract carriage. ICC initiative previously exempted fresh fruits and vegetables and piggy-back shipments from regulation. Contracts make possible the direct negotiation of specific shippers and carriers for specific rate and service packages designed to shipper and carrier logistical needs.

Secondly, a pair of provisions stimulates inter-railroad competition, previously shown to be very important in market rate control. One provision restricts the activities of rate bureaus preventing discussion and voting on single-line rates and, after 1983, discussion of joint-rates by other than "practicably participating" carriers. Another provision establishes a quick procedure by which shippers can petition for reciprocal switching agreements between railroads. This means that shippers in two-railroad towns who are located on only one railroad can obtain access to both railroads, with obvious competitive value.

Third, rail abandonment procedures are made speedier than previously, but more market options are made available to shippers and groups who truly value the line. These options included: a) carload surcharges on low-traffic lines, b) rail-affiliated truck services to communities losing rail lines (previously truck allowances applied only to communities with rail lines) and c) forced sale of deteriorating branch lines to local groups.

Previously, evidence showed that with moderate inter-railroad competition railroad rate freedom would not harshly affect agriculture, generally. Through rate bureau limitations and reciprocal switching agreements, inter-railroad competition is enhanced. Rate flexibility can and is being used to enter new markets offering shippers savings. Contracts and exemptions open a new field of negotiated, tailored rate-service packages to shippers yielding enhanced capacity utilization for railroads and improved service for shippers. Shippers and local community groups are now allowed greater flexibility in bargaining directly with railroads on means to preserve local rail services, where options were restricted before. Railroad regulatory reform offers many new opportunities for creative marketing and procurement in agricultural industries.

Conclusion

Transportation regulatory reforms represent opportunities for agriculture. As with any change of rules, there will be cases of individuals losing while others gain as a result of regulatory reform. But evidence does not reveal any fulfillment of the criteria for maintaining regulation in the agricultural transportation markets. These markets are

competitive. Cost incentives encourage capacity utilization. The profit motive encourages entry and bargaining for service. Agriculture would be well served if remaining motor carrier entry restrictions and railroad rate limits were removed on a path toward true deregulation.

Regulation has been largely counter-productive for agriculture. A layer of restrictions on competitive market processes has been substantially removed; direct bargaining between firms promotes transmission of clearer market signals. "Deregulation" offers many opportunities for agricultural firms to adjust marketing and procurement strategies to reflect a greater range of transportation price and service options.

FOOTNOTES

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