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ECONOMICS OF TRUCKING: AN ANNOTATED BIBLIOGRAPHY

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UNITED STATES DEPARTMENT OF AGRICULTURE
ECONOMIC RESEARCH SERVICE
ERS-658

ECONOMICS OF TRUCKING: AN ANNOTATED BIBLIOGRAPHY, compiled and annotated by John O. Gerald, Economic Research Service, and Robert J. Byrne, Farmer Cooperative Service, U.S. Department of Agriculture. ERS-658.

ABSTRACT

More than 40 reports and papers based on research in the U.S. Department of Agriculture into the economics of agricultural and cooperative trucking are compiled and annotated. The period covered by the listings is from 1950 to July 1976.

Keywords: Agriculture, agricultural exemption, cooperative exemption, transportation, trucking.

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ECONOMICS OF TRUCKING: AN ANNOTATED BIBLIOGRAPHY

by

John O. Gerald and Robert J. Byrne 1/

PREFACE

The annotated bibliography on the economics of trucking was developed at the request of the U.S. Department of Transportation. Information is included on the economic performance of the unregulated trucking industry, on agricultural and cooperative trucking, and on the impacts flowing to railroads and the regulated for-hire motor carriers from the agricultural and cooperative trucking exemptions in the 1935 Motor Carrier Act. These exemptions have permitted a substantial, unregulated for-hire trucking sector to exist alongside the regulated railroads and truckers. Nonetheless, the exemptions have not prohibited the regulated firms from participating in the hauling of unmanufactured agricultural commodities and the traffic generated by farmers' cooperatives.

The bibliography is not complete, but it does include most of the U.S. Department of Agriculture research reports that describe the structure and performance of the exempt trucking sector. Many of the publications are out of print. These may be borrowed from the National Agricultural Library, Beltsville, Maryland; the Library of Congress, Washington, D.C.; libraries at State Universities and Land-Grant Colleges; and many public libraries. None of the reports are copyrighted and therefore may be reproduced.

1/ John O. Gerald is an agricultural economist, National Economic Analysis Division, Economic Research Service. Robert J. Byrne is a senior agricultural economist-transportation, Farmer Cooperative Service.

Agricultural Exemption in Interstate Trucking: Developments in 1957-58*

Celia Sperling

Agricultural Marketing Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-352, July 1959

This study discusses agricultural exemption in interstate trucking from 1957 to 1958. The year 1958 was significant because Congress amended the exemption by adding a commodity list specifying the exempt or non-exempt status of each commodity. The act brought frozen fruits and vegetables back under regulation after 2 years of being exempt, and some imported commodities became regulated for the first time.

The Agricultural Exemption in Interstate Trucking--A Legislative and Judicial History*

Celia Sperling

Agricultural Marketing Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-188, July 1957

Information from the Interstate Commerce Act related to exempting motor carriers of agricultural commodities (including unmanufactured products thereof) from economic regulations showed a steady progress of court decisions overturning restrictive interpretations of the exemption. By 1956, the exemption had been interpreted firmly as related to the vehicle and the commodity hauled, not to the carrier as such. The courts had ruled that limited processing of agricultural commodities did not make them regulated commodities. The most difficult decisions appeared from the record to be (1) the right of carriers holding interstate operating rights to use their equipment in the hauling of exempt commodities, (2) the definition of "unmanufactured agricultural commodities," and (3) the right of carriers not holding interstate operating rights to lease equipment and drivers on a trip lease basis for the interstate movements of regulated commodities.

*Asterisk denotes publication is out of print.

Comparison of For-Hire Motor Carriers Operating Under the
Agricultural Exemption with Regulated Motor Carriers*

Walter Miklius

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-769, August 1966

In 1963, the modal fleet size for motor carriers not having interstate operating rights was 2 to 3 truck-tractors, compared with 20 to 49 for the regulated motor carriers. But there were not statistically significant differences in the model years and lifetime mileages of truck-tractors operated by the two types of firms or in annual miles traveled per tractor. There were relatively more two-way loaded round trips undertaken by the regulated firms, 54.2 percent, compared to only 37.1 percent for those without operating rights.

Economic Performance of Motor Carriers Operating Under the
Agricultural Exemption in Interstate Trucking*

Walter Miklius

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-838, January 1969

Analysis of available data resulted in several conclusions about the economic performance of unregulated trucking in the United States. One was that unregulated agricultural motor carriage provides a price-product combination which users prefer to that of regulated carriage. The rate structure appeared to be patterned on the costs of providing the service. There was no basis found for concluding that competition in the unregulated sector had been excessive and wasteful. The "agricultural exemption" probably had the effect of diverting some exempt commodity traffic from rail to truck, at least prior to 1957, and may have diverted some from private to for-hire trucks. Nonetheless, the principal diversion impact appeared to be the diverting of agricultural commodities from regulated to unregulated trucking. The overall conclusion was that the "agricultural exemption" has achieved the objectives of providing higher quality service and/or lower rates to shippers of agricultural commodities.

For-Hire Motor Carriers Hauling Exempt Agricultural Commodities--Nature and Extent of Operations*

Mildred R. DeWolfe

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-585, January 1963

Substantial stability of motor carrier firms not holding interstate operating rights (so-called "exempts") was found from the survey results reported here. Over three-fourths of all respondents had been in business 5 or more years, and four-tenths for 15 or more years. The firms were typically small. The 50 largest firms operated an average of only 20 tractors and semi-trailers. Grain and livestock together accounted for about half of the annual tonnage hauled by all respondents. Three-fourths of the tonnage moved outbound; vegetables provided the largest volume of homebound tonnage. Seventy percent of 1960 mileage was loaded. Over one-third of the tonnage originated by these carriers moved interregionally. Those vehicles operating only in interstate movements averaged 70,000 miles of travel in 1960.

For-Hire Trucking of Exempt Farm Products: Operating Practices and Nature of Competition*

Bruce H. Wright

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-649, March 1964

More than half of the surveyed motor carriers without interstate operating rights considered similar motor carriers to be their principal competitors for the movement of exempt agricultural commodities. Of the 137 interviewed regular truckers, 95 reported no seasonal variability in rates. An additional 50 truckers who only occasionally operated for-hire in exempt traffic were interviewed. These were largely private truckers who entered the for-hire markets to balance either seasonal or directional traffic patterns. Fifteen of the 50 truckers operated as merchant truckers except when price expectations made them unwilling to take title to the goods hauled. Occasional and regular carriers used similar methods to obtain business, encountered similar sources of competition, charged about the same rates, and had about the same amount of trip leasing.

Interstate Trucking of Fresh and Frozen Poultry Under Agricultural Exemption*

James R. Snitzler and Robert J. Byrne
Agricultural Marketing Service, U.S. Dept. of Agr.
Washington, D.C.
MRR-224, March 1958

This report is a landmark study of changes in rates and quality of services following a change in regulatory status. The exempt rates in 1956-57 on fresh poultry were lower in 82 percent of the cases than were the regulated rates in 1952; and in 85 percent of the cases, exempt rates were lower than the 1955 rates for the frozen product. The use of for-hire trucks in lieu of private trucks went up for each of the products after exemption. Users of for-hire trucks gave opinions about the relative quality and quantity of services provided by regulated and exempt carriers. Exempt rates were reported to be quite stable.

Interstate Trucking of Frozen Fruits and Vegetables Under Agricultural Exemption*

J. C. Winter and Ivon W. Ulrey
Agricultural Marketing Service, U.S. Dept. of Agr.
Washington, D.C.
Supplement to MRR-316, July 1961

This study is a second comparison of regulated versus exempt rates and services for frozen fruits and vegetables. Exempt rates in August 1958 and regulated rates in October 1960 are compared. Because of their predominant use of rail service before and after 1958, processors in the Far West generally reported no change in truck service. In the East, the Midwest, and the South, many processors reported that services had become more difficult to find, particularly services to new markets. A few processors resorted to private transport for needed services. Processors in the central and eastern parts of the country reported that increased rates predominated after 1958.

Interstate Trucking of Frozen Fruits and Vegetables Under
Agricultural Exemption*

James R. Snitzler and Robert J. Byrne
Agricultural Marketing Service, U.S. Dept. of Agr.
Washington, D.C.
MRR-316, March 1959

This report is a landmark study of changes in rates and quality of services following a change in regulatory status. The exempt rates in 1957 were lower in 88 percent of the cases than were the regulated rates in 1955. The use of for-hire trucks in lieu of private trucks increased after exemption. Various opinions of shippers about the relative quality and cost of service provided by regulated and exempt carriers are reported.

"Part I: Transportation in Rural America," Prelude to Legislation to Solve the Growing Crisis in Rural Transportation
Prepared by the Economic Research Service, U.S. Dept. of Agr.

U.S. Senate, Committee on Agriculture and Forestry
Washington, D.C.
February 10, 1975

Trucking is reviewed in connection with this overall review of transportation for rural areas. The ability of trucks to provide rapid and reliable delivery service and the improvements in highways, particularly the interstates, were considered to have led to the nearly complete shift of perishables and livestock to trucks. It was concluded that trucking capacity can generally be expanded to meet demand, and that the agricultural exemption allows the flexibility that is essential to orderly marketing of perishables. Exemption from regulation of general commodity freight service to and from rural areas, it was suggested, would have little undesirable effect on railroads or regulated truckers because such traffic often generates high costs and low revenues for regulated carriers. Trucks and highways were found to have permitted substantial decentralization of economic activities, and railroads were found not to dominate rural transportation or rural development potentials.

Private Motor Carriers of Exempt Agricultural Commodities:
Number, Length of Time in Business, Types, and Capacity of
Vehicles*

T. Q. Hutchinson

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-696, March 1965

A survey of 9,300 business firms transporting some or all of their own products by truck identified 701 firms that did some for-hire hauling of exempt agricultural commodities. These firms originated more than 11 million tons of exempt for-hire traffic in 1961. More than half of their total mileage was used in hauling exempt commodities, and about four-fifths of exempt loads were backhauls. However, only 20 percent of the trips with exempt commodities went interstate. These firms were somewhat larger on the average in terms of number of trucks operated than were those for-hire motor carriers not having interstate operating rights. But they were not as large as regulated motor carriers.

"Research on Economics of Livestock Transportation," presented to Livestock Transportation Forum, National Livestock Dealers Association, Albuquerque, New Mexico

John O. Gerald

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

March 1, 1973

The author discussed the economic analysis that was undertaken to identify gaps in knowledge about the economic performance of livestock truckers under the "agricultural exemption," and the research projects underway in the Economic Research Service to help fill the gaps. The history of the "agricultural exemption" and two 1957 landmark studies of the rate level and quality of service were reviewed. The history showed that concern for both factors was important in bringing the exemption into the Motor Carrier Act of 1935. The studies of the fifties found that changes in the rate level and service quality occurred when two products were subjected to change in regulatory status. Analysis of the rationales underlying incentives for regulation led to rejection of public safety and monopoly organization as offering justification for economic regulation of livestock trucking. Supply control and cross-subsidy rationales could not be rejected as irrelevant, but studies to supply information about

economies of size and short-run costs were thought necessary to help close information gaps. The studies underway or completed were discussed.

STRUCTURAL AND INSTITUTIONAL ATTRIBUTES OF AGRICULTURAL TRUCKING

Comparison of For-Hire Motor Carriers Operating Under the Agricultural Exemption with Regulated Motor Carriers*

Walter Miklius

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-769, August 1966

(See Agricultural Exemption in Interstate Trucking)

"Comparison of Small Truck Carriers," The Marketing and Transportation Situation

Elizabeth L. Murphy

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MTS-165, May 1967

This report is an analysis of records obtained by the Motor Carrier Survey of the 1963 Census of Transportation for 4,305 truck carriers not subject to economic regulations in their interstate trucking. This was the first Census of Transportation ever undertaken in the United States. Based on the survey, it was estimated that 11,369 carriers of unmanufactured agricultural commodities having no interstate operating rights existed in 1963. The analysis compared these "exempt" carriers to Class III carriers in terms of revenues, expenses, number of vehicles per firm, and profits per vehicle mile and per ton carried. "Exempt" carriers had 1.7 straight trucks and 1.6 truck-tractors per firm, total costs of 32 cents per vehicle mile, and total revenues of 35 cents per vehicle mile. The regulated firms averaged 3.0 straight trucks and 3.0 truck-tractors, had total costs of 48 cents per vehicle mile, and had total revenues of 51 cents per vehicle mile.

"Economic Performance in Trucking of Livestock," presented to Southern Agricultural Economics Association, Mobile, Alabama

Patrick P. Boles

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

February 2, 1976

This analysis of facts and data gathered in four surveys of livestock trucking conducted since 1971 found little evidence that economic regulation of interstate for-hire livestock trucking would improve the economic performance of these firms. Many of the problems perceived by various interested parties were found not to be widespread or were caused by the cost structure of livestock trucking firms or by the highly seasonal movement of feeder cattle. Few of the shippers interviewed reported dissatisfaction with the services they received from truckers; in fact, more than 90 percent reported that they were satisfied and many were complimentary of the attitudes of truckers and drivers. Distance and type of truck explained most of the rate variability found, but backhaul rates were lower on the average than were the front haul rates. Average years in business by livestock truckers were 18.3. Equipment was used intensively, and fuel cost increases between 1973 and 1974 were reflected in rate increases, accounting for about half of the increase.

Economics of Farm Products Transportation*

Ivon W. Ulrey

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-843, March 1969

Analysis of intermodal competition for farm products traffic led to a conclusion that the "agricultural exemption" and the "bulk commodities exemption" have resulted in a freight rate structure under which shippers of farm products pay freight charges that approximate the lowest rates at which either or all of these rail, water, or truck carriers are prepared to offer service. Trucks were found to predominate in some markets, truck-water combined modes prevailed in others, and rail in still others. The evidence presented was judged to show that rail responses to intermodal rate competition have been limited by the cost levels of competing carriers, and that this pattern of restricted rate reduction had limited the

benefits of intermodal competition to certain areas, commodities, and shippers. The author concluded that the geographic flexibility of exempt truckers portends a continuing potential competition for railroads that gives substantial protection to agricultural shippers. Free entry and profit incentives were deemed essential to this protection, and past performance has proved their effectiveness.

Economic Performance of Motor Carriers Operating Under the Agricultural Exemption in Interstate Trucking*

Walter Miklius

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-838, January 1969

(See Agricultural Exemption in Interstate Trucking)

Effects of State and Local Regulations on Interstate Movement of Agricultural Products by Highway*

Josephine Ayre

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-496, July 1961

This report is the second in a series from a study of impacts of highway barriers on interstate commerce. The study found that agriculturally "exempt" carriers experienced difficulty in meeting State requirements to operate interstate, and total taxes paid varied substantially among the 20 States examined. Shippers reported several effects on their marketing decisions from the variable State laws and regulations: (1) Unavailability of motor vehicles for shipping into certain areas; (2) increased costs through higher rates; (3) loss of markets; (4) interference with flexibility of service; and (5) interference with convenience of service. Motor carriers, truck brokers and shippers reported most frequently the same following regulations or taxes as interfering most with operations of motor carriers: (1) The fuel-use tax; (2) the requirements to obtain State operating authorities; (3) the ton-mile tax; and (4) the axle-mile tax. Some progress was found in moving toward uniformity of regulations and taxes and reciprocity arrangements among the States.

For-Hire Motor Carriers Hauling Exempt Agricultural Commodities--Nature and Extent of Operations*

Mildred R. DeWolfe

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-585, January 1963

(See Agricultural Exemption in Interstate Trucking)

For-Hire Trucking of Exempt Farm Products: Operating Practices and Nature of Competition*

Bruce H. Wright

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-649, March 1964

(See Agricultural Exemption in Interstate Trucking)

Highway Transportation Barriers in 20 States*

Hugh S. Norton

Agricultural Marketing Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-157, March 1957

The report is an exploratory study of the differential impacts accruing to perishable farm products from variations among the States in laws and regulations affecting trucking. Estimated tax loads borne by truckers in the several States were also derived and found to differ very substantially.

Interstate Barriers to Truck Transportation*

Margaret R. Purcell

Bureau of Agricultural Economics, U.S. Dept. of Agr.

Washington, D.C.

Unnumbered, December 1950

Surveys and analyses of the use by States of truck and highway regulations and taxes of various types were undertaken. State laws applied in several ways to size, weight, and other equipment limitations; ports of entry and other forms of quarantines and inspections; and regulations of rates, routes, and services of intrastate trucking. In addition, some States placed obligations on itinerant merchant truckers, who moved their operations seasonally. The status of such regulations and taxes in the thirties was contrasted to their status in the late forties. The progressive or regressive effects of changes on interstate commerce were also assessed.

Operations of For-Hire Livestock Trucking Firms

Patrick P. Boles

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

AER-343, July 1976

A survey of for-hire livestock trucking conducted in 1974 found firms to be stable, with no significant differences in the average years in business of firms in States with intrastate economic regulation and those in States without such regulations. The average firm size was about five tractors and trailers. Average yearly mileage per truck was about 83,000 miles, compared with 80,000 for Class I truckers in 1973. Average miles per livestock truck-tractor were about 94,000. Seasonality was high, with shipments during September through November being 45 percent higher than in February through April. Analysis of rates charged found that distance, size of truck, and direction of the haul (backhaul rates were lower than fronthaul rates) explained most of the variability reported. Backhaul loads were obtained on only about 10 percent of the trips, and there was a positive relation between length of trip and percentage use of backhaul capacity. The truckers had claims filed against less than 1 percent of their loads. About 95 percent of all loads resulted from direct contact between the truckers and the shippers.

"Part I: Transportation in Rural America," Prelude to Legislation to Solve the Growing Crisis in Rural Transportation

Prepared by the Economic Research Service, U.S. Dept. of Agr.

U.S. Senate, Committee on Agriculture and Forestry

Washington, D.C.

February 10, 1975

(See Agricultural Exemption in Interstate Trucking)

Private Motor Carriers of Exempt Agricultural Commodities: Number, Length of Time in Business, Type, and Capacity of Vehicles*

T. Q. Hutchinson

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-696, March 1965

(See Agricultural Exemption in Interstate Trucking)

"Research on Economics of Livestock Transportation," presented to Livestock Transportation Forum, National Livestock Dealers Association, Albuquerque, New Mexico

John O. Gerald

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

March 1, 1973

(See Agricultural Exemption in Interstate Trucking)

"Research on Livestock Transportation," presented to the Transportation Committee, American National Cattlemen's Association, Denver, Colorado

John O. Gerald

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

January 19, 1972

Available information on supply, demand, and price of livestock trucking services was used to assess research needed by the livestock and livestock trucking industries. Available information on the use of the joint-product backhaul capacity of livestock trucks suggested limited use--20 percent or less of all return trips having loads. Similarly, available information suggested few economies of large-sized trucking firms beyond those achievable by one-truck firms. The structure of the for-hire livestock trucking industry appeared to be that of many small firms. Private trucking potential seemed large. Analysis of a set of trucklot, interstate livestock rates, available from an earlier study, found that these rates were highly correlated with one-way loaded, round trip costs of operating milk trucks in 1966.

Role of "Regulated" Motor Carriers in Hauling Agricultural Commodities in Interstate Commerce*

Joseph R. Potter

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

ERS-209, November 1964

Traffic statistics available for Class I motor carriers included tons and revenues for agricultural products, and animals and animal products, some of which are not exempt from economic regulation. Incentives responsible for engagement in hauling exempt commodities by motor carriers having interstate operating rights for regulated traffic were said to be (1) to help balance traffic in both directions, and (2) to curtail the effects of seasonality and

irregularity of regulated freight movements. Even so, at no time over the 6-year record examined in the study did all agricultural traffic account for more than 6.6 percent of the total truckload traffic of Class I motor carriers nor did it contribute to more than 9.5 percent of their total revenues.

Role of Truck Brokers in the Movement of Exempt Agricultural Commodities*

John H. Hunter, Jr.

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-525, February 1962

Truck brokers operate to bring together shippers needing empty trucks for loading and truckers needing loads. Truck brokers were used the most frequently for perishable crops--the fruits and vegetables. Seasonal harvests of these crops in different areas make direct contact between shippers and truckers difficult. Truckers not holding any interstate operating rights accounted for four-fifths of the tonnage booked by exempt commodity truck brokers in 1959; private truckers operating for-hire in exempt commodities, one-tenth; and truckers holding interstate operating rights, one-tenth. About half of the truck brokers also operated as truckers. The brokers were found to establish rates on less than half of the tonnage booked. Rates varied somewhat seasonally, but had shown no pronounced trend in level over the past decade. A continuing role for truck brokers in the movement of perishables was projected.

RATES AND COSTS IN AGRICULTURAL TRUCKING

"Comparison of Small Truck Carriers," The Marketing and Transportation Situation

Elizabeth L. Murphy

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MTS-165, May 1967

(See Structural and Institutional Attributes of Agricultural Trucking)

Controlling Motortruck Operating Costs of Farmer Cooperatives

Thomas H. Camp and Wesley R. Kriebel

Farmer Cooperative Service, U.S. Dept. of Agr.

Washington, D.C.

Information 58, October 1968

The report suggests procedures and forms cooperatives and other firms can use to reduce and control expenses for operating their own trucks. The study suggests an organizational structure, outlines duties and responsibilities of truck fleet employees, provides procedures for handling repair work, emphasizes preventive maintenance, and gives examples of records and reports to use in controlling costs.

Costs and Practices of Selected Cooperatives in Operating Bulk-Feed Trucks*

Thomas H. Camp

Farmer Cooperative Service, U.S. Dept. of Agr.

Washington, D.C.

General Report 132, October 1965

Bulk-feed trucking operations of seven selected farmer cooperatives during 1963 are analyzed. Operating costs are examined and more efficient practices are suggested. The study covers 110 bulk-feed trucks, which traveled over 3 million miles and hauled more than half a million tons of bulk-feed from 17 distribution points. Detailed truck costs are broken down by mile, ton, type, and size of vehicle. Truck loading and unloading times and equipment are also evaluated. Major deterrents to efficient operations include poor unloading equipment, type and location of farm bulk bins, low-hanging power lines, and temporary highway weight embargoes.

Costs of Operating Exempt For-Hire Motor Carriers of Agricultural Commodities: A Pilot Study in Delaware, Maryland, and Virginia*

John H. Hunter, Jr.

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

ERS-109, February 1963

The 25 exempt motor carriers from whom 1960 cost and revenue data were obtained had average total costs of nearly 29 cents per vehicle mile and average gross revenues of 30.5 cents per vehicle mile. Direct operating costs amounted to more than 70 percent of total costs. Loads were onboard for 60 percent of the

vehicle miles. Fifteen of the carriers also engaged in businesses other than trucking, but they were not private carriers. The 25 motor carriers operated 290 pieces of equipment--124 tractors, 144 trailers, and 22 straight trucks or 10-wheelers. The 3 largest firms operated 20 or more pieces of equipment.

Cost of Operating Trucks for Livestock Transportation

Patrick P. Boles

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-982, January 1973

Costs in this report are based on analysis of a model of 10-truck firms specializing in hauling particular distances with given seasonalities and backhaul settings. In a separate analysis, the effect of level of utilization of equipment used in a mix of trip distances on cost was assessed. For nonseasonal, one-way loaded round trips, cost per vehicle mile ranged from 37.3 cents at 2,500 miles to 59.4 cents at 50 miles. Adding backhauls of livestock added 29.1 cents per vehicle mile for the 50-mile round trips and 0.2 cent per vehicle mile for the 2,500-mile round trips. A seasonality pattern, where the peak period required 50 percent more capacity than that required in the average period, added 13.6 cents per vehicle mile for the 50-mile round trip and 1.7 cents for the 2,500-mile round trip. Given a mix of trip distances, cost per vehicle mile for a truck driven 150,000 miles annually was 38.8 cents; for one driven only 60,000 miles, the cost was 46.8 cents. The latter mix of trip distances was considered typical of livestock truckers' operations, with total annual miles achievable depending on seasonality.

Cost of Transporting Bulk and Packaged Milk by Truck*

Orval Kerchner

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-791, May 1967

Synthetic cost analysis of engineering data to derive costs indicated that for short distances of about 40 miles, one-driver trucks with 30,000-pound payloads would minimize the cost of transporting milk directly to plants. Beyond this distance, transferring the milk from these smaller farm pickup trucks to trucks with 49,000-pound payload capacity for movement was

economical. At distances greater than 200 miles, it became economical to have two drivers. Fixed costs resulted in the cost per vehicle mile or per hundred-weight mile declining as the length of trip increased. The report shows the hours required per trip to perform various functions, and the cost elements of carrier operations for 1966. The results demonstrate that a uniform rate per vehicle mile or per loaded mile would not be economically efficient.

Economic Performance of Motor Carriers Operating Under the Agricultural Exemption in Interstate Trucking*

Walter Miklius

Economic Research Service, U.S. Dept. of Agr.
Washington, D.C.

MRR-838, January 1969

(See Agricultural Exemption in Interstate Trucking)

Economics of Farm Products Transportation*

Ivon W. Ulrey

Economic Research Service, U.S. Dept. of Agr.
Washington, D.C.

MRR-843, March 1969

(See Structural and Institutional Attributes of Agricultural Trucking)

"Economic Performance in Trucking of Livestock," presented to Southern Agricultural Economics Association, Mobile, Alabama

Patrick P. Boles

Economic Research Service, U.S. Dept. of Agr.
Washington, D.C.

February 2, 1976

(See Structural and Institutional Attributes of Agricultural Trucking)

"Implications of Costs of Trucking Livestock," presented to Transportation Committee, American National Cattlemen's Association, San Antonio, Texas

John O. Gerald

Economic Research Service, U.S. Dept. of Agr.
Washington, D.C.

January 24, 1973

The discussion of an economic-engineering analysis of the cost of trucking livestock presents graphically the relationship of cost per loaded mile to distance; the relationship of costs added by seasonality to distance; and the costs added to one-way loaded, round trip costs by backhauling at various distances.

The cost structure found to exist shows clearly that the occurrence of different charges per vehicle mile or per loaded mile did not necessarily prove economic discrimination. It was considered necessary that for-hire truckers know their specific costs and charge rates accordingly if they were to avoid diversion of their low-cost traffic by truckers specializing in such traffic or by private truckers. Either producer or consumer interest required the use of the low-cost backhaul capacity of trucks so long as benefits of use exceeded the added costs. Close agreement was found between the 1970 costs estimated in the study and the interstate rates (adjusted to reflect a 15- to 20-percent backhaul) charged by a group of Kansas livestock truckers for 1970.

Interstate Trucking of Fresh and Frozen Poultry Under Agricultural Exemption*

James R. Snitzler and Robert J. Byrne
Agricultural Marketing Service, U.S. Dept. of Agr.
Washington, D.C.
MRR-224, March 1958
(See Agricultural Exemption in Interstate Trucking)

Interstate Trucking of Frozen Fruits and Vegetables Under Agricultural Exemption*

J. C. Winter and Ivon W. Ulrey
Agricultural Marketing Service, U.S. Dept. of Agr.
Washington, D.C.
Supplement to MRR-316, July 1961
(See Agricultural Exemption in Interstate Trucking)

Interstate Trucking of Frozen Fruits and Vegetables Under Agricultural Exemption*

James R. Snitzler and Robert J. Byrne
Agricultural Marketing Service, U.S. Dept. of Agr.
Washington, D.C.
MRR-316, March 1959
(See Agricultural Exemption in Interstate Trucking)

Long-Distance Shipment of Market Milk*

William T. Butz
Economic Research Service, U.S. Dept. of Agr.
Washington, D.C.
MRR-648, March 1964

A survey of 400 milk plants handling bulk milk for fluid use showed substantial seasonality in the volume of bulk milk moving more than 200 miles to markets. Nine carriers operating nearly 200 tank

trucks did most of the hauling. Less than 10 percent of the trips had loads in both directions. For tankers carrying 5,000 gallons or more, rates increased 14.9 cents per 100 miles, compared with 16.3 cents per 100 miles for tankers carrying 4,000 gallons. There was some evidence that rates had been stable for several years, in part, because of improved highways and larger load limits, and in part because a declining volume of long-distance shipments kept hauling capacity from being strained.

Motortruck Leasing by Farmer Cooperatives*

William C. Bowser, Jr.

Farmer Cooperative Service, U.S. Dept. of Agr.

Washington, D.C.

Information 14, June 1961

This report is an analysis of secondary data on application and types of motortruck leasing available to cooperatives in lieu of truck ownership or use of for-hire trucks. The study shows that leasing trucks was more costly than was owning trucks. Although freeing working capital was considered the main reason for leasing trucks, the true value of capital invested in an efficient, well-managed private trucking operation was thought to be grossly underrated. Differences between maintenance and finance leases and various Interstate Commerce Commission leasing regulations were reviewed and evaluated.

Motortruck Operating Costs of Farmer Cooperatives*

Thomas H. Camp

Farmer Cooperative Service, U.S. Dept. of Agr.

Washington, D.C.

General Report 121, June 1964

This report gives results of a detailed study of motortruck operating costs of 20 farmer cooperatives operating 656 truck-tractors and straight trucks which traveled over 38 million miles in 1962. Total operating costs averaged 36 cents a mile. Information obtained from 18 of the 20 cooperatives showed that the cooperatives had backhauls for only 46,627 of the 213,606 trips their trucks made in 1962, or 21.8 percent. Almost 93 percent of these backhauls were the cooperatives' goods. "Adequate service not available for needs" and "more economical" were the reasons most often given for operating their own trucks. "Operating problems" and "meeting various State vehicle size and

weight laws" were the principal disadvantages or problems given by management in operating its own trucks.

Operations of For-Hire Livestock Trucking Firms

Patrick P. Boles

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

AER-343, July 1976

(See Structural and Institutional Attributes of Agricultural Trucking)

Out-of-Market Bulk Milk Shipment Charges for Selected Federal Order Markets

Herbert H. Moede

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-959, May 1972

Analysis of charges for trucking spot shipments (irregular) of bulk milk between Federal Order milk markets found 95 percent of the charges per hundredweight mile in 1970 to be between 0.1200 and 0.2799 cent. The overall average charge of 0.155 cent per hundredweight mile was about 70 to 75 cents per loaded mile. Multiple regression analysis found that distance and load size variables explained most of the differences in charges.

Over-the-Road Cost of Hauling Bulk Milk

Herbert H. Moede

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-919, January 1971

The study updates the costs for hauling bulk milk reported in MRR-791, Cost of Transporting Bulk and Packaged Milk by Truck. Estimated ownership cost per hundredweight per one-way loaded trip mile was 0.074 cent at 25 miles and 0.020 cent at 750 miles; labor costs, 0.163 cent at 25 miles and 0.045 cent at 750 miles; operational and subsistence cost, 0.056 cent at 25 miles and 0.064 cent at 750 miles; and total cost, 0.294 cent at 25 miles and 0.130 cent at 750 miles. Ownership cost per hundredweight per one-way loaded trip mile increased from 0.074 cent (7-day week) to 0.103 cent (5-day week) at 25 miles and from 0.020 cent to 0.029 cent at 750 miles. The study results demonstrate that a uniform rate per vehicle mile or per loaded mile would not be economically efficient.

Petroleum Tank Truck Operating Costs of Selected Farmer Cooperatives*

Thomas H. Camp

Farmer Cooperative Service, U.S. Dept. of Agr.

Washington, D.C.

Service Report 86, 1967

Petroleum tank truck operating costs are evaluated for 4 farmer cooperatives operating 66 truck tractors and straight trucks which traveled over 3.6 million miles in 1962. Operating costs averaged almost 40 cents a mile. Direct costs accounted for two-thirds of total operating costs. Drivers' wages were the largest expense item, accounting for over 60 percent of direct costs. Depreciation of motor trucks and facilities was the largest overhead cost item, accounting for 58 percent of total overhead costs.

"Research on Livestock Transportation," presented to the Transportation Committee, American National Cattlemen's Association, Denver, Colorado

John O. Gerald

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

January 19, 1972

(See Structural and Institutional Attributes of Agricultural Trucking)

Transportation and Handling of Grain by Motortruck in the Southwest*

William J. Hudson

Production and Marketing Administration, U.S. Dept. of Agr.

Washington, D.C.

Unnumbered, May 1952

By 1950, motortrucks were widely used in distributing grain beyond the country elevator (first buyer) level of marketing by nonfarm grain firms in New Mexico, Oklahoma, and Texas. Although rates did change in response to local competitive situations, a general pattern of truck rates was found. These rates were as much as 50 percent below rail rates for identical hauls. Lower rates, better services, boxcar shortages, and lower handling costs by trucks were among the reasons cited by shippers for using trucks. Some shippers operated private trucks, hauling grain out of the production area and returning with farm input items such as fertilizer, fence posts, and binder

twine. Unethical business practices of merchant truckers were cited by some shippers as reasons for using rail.

Transportation of Cattle in the West*

William N. Capener, and others

Economic Research Service, U.S. Dept. of Agr., in cooperation with the University of Wyoming, Laramie, Wyoming
Research Journal 25, January 1969

The authors study intrastate and interstate transportation of cattle in the western region of the United States. Rail and truck forms of transport and rates are analyzed in depth. About 75 percent of all western livestock shipments in 1962 were moved by truck. However, rates were found to be favorable for relatively short hauls by trucks but favorable to rails for the longer hauls. Thus, the traffic share of trucks appears to stem from other factors such as convenience, flexibility, and substantially more rapid transit. Eighty-one percent of the tonnage of livestock truckers surveyed was outbound from the area of the truckers and only 19 percent was inbound. However, a direct measure of empty miles was not developed. Most interstate truck rates were reported in cents per vehicle mile, different than the hundred-weight rates reported for most intrastate hauls, especially in States regulating truck rates. Intrastate rates were found to differ among several States.

COOPERATIVE TRUCKING

Controlling Motortruck Operating Costs of Farmer Cooperatives

Thomas H. Camp and Wesley R. Kriebel

Farmer Cooperative Service, U.S. Dept. of Agr.
Washington, D.C.

Information 58, October 1968

(See Rates and Costs in Agricultural Trucking)

Costs and Practices of Selected Cooperatives in Operating Bulk-Feed Trucks*

Thomas H. Camp

Farmer Cooperative Service, U.S. Dept. of Agr.
Washington, D.C.

General Report 132, October 1965

(See Rates and Costs in Agricultural Trucking)

Motortruck Operating Costs of Farmer Cooperatives*

Thomas H. Camp

Farmer Cooperative Service, U.S. Dept. of Agr.

Washington, D.C.

General Report 121, June 1964

(See Rates and Costs in Agricultural Trucking)

Motortruck Leasing by Farmer Cooperatives*

William C. Bowser, Jr.

Farmer Cooperative Service, U.S. Dept. of Agr.

Washington, D.C.

Information 14, June 1961

(See Rates and Costs in Agricultural Trucking)

Motortrucks Operated by Farmer Cooperatives

Thomas H. Camp and William M. Holroyd

Farmer Cooperative Service, U.S. Dept. of Agr.

Washington, D.C.

Research Report 2, August 1968

The report presents a general inventory of motortrucks that U.S. farmer cooperatives own and lease, by type of cooperative, size and type of vehicle, and geographic location. The 8,593 cooperatives owned or leased an estimated 37,000 motortrucks as of January 1, 1967. Over half of the cooperatives reported they owned or leased trucks. Eighty-eight percent of the trucks were straight trucks and only 12 percent were tractor-trailers. Truck mileage of all farmer cooperatives in 1966 was estimated at 780 million miles but only 15 percent of this was interstate. About 44 percent of farmer co-ops with interstate hauling reported backhauls, and such backhaul trips accounted for 21 percent of their total trips. Of these backhauls, 89 percent consisted of the co-ops' own or members' goods; 8.5 percent were exempt agricultural commodities; and all other goods amounted to only 2.5 percent.

Petroleum Tank Truck Operating Costs of Selected Farmer Cooperatives*

Thomas H. Camp

Farmer Cooperative Service, U.S. Dept. of Agr.

Washington, D.C.

Service Report 86, 1967

(See Rates and Costs in Agricultural Trucking)

Transportation Activities of Selected Farmer Cooperatives

Earl B. Miller

Farmer Cooperative Service, U.S. Dept. of Agr.

Washington, D.C.

Information 96, August 1974

Information from 71 of the Nation's largest cooperatives, which accounted for 42 percent of total volume of all co-ops, shows total costs of transportation by each type of for-hire and private carrier and expenditures on other traffic functions; value of outbound and inbound shipments; tonnage moved by the various types of transportation inbound and outbound; reasons for using and not using various modes of transportation; and reasons for cooperatives operating their own transportation equipment and problems related to doing so. For-hire rail accounted for 48 percent of the co-ops' total cost of transportation. For-hire trucks accounted for 26 percent--common carriers, 9 percent; exempt haulers, 9 percent; contract truckers, 5 percent; and co-op trucking associations, 3 percent.

TRANSPORTING COMMODITIES BY TRUCK

Cost of Operating Trucks for Livestock Transportation

Patrick P. Boles

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-982, January 1973

(See Rates and Costs in Agricultural Trucking)

Cost of Transporting Bulk and Packaged Milk by Truck*

Orval Kerchner

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-791, May 1967

(See Rates and Costs in Agricultural Trucking)

"Economic Performance in Trucking of Livestock," presented to Southern Agricultural Economics Association, Mobile, Alabama

Patrick P. Boles

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

February 2, 1976

(See Structural and Institutional Attributes of Agricultural Trucking)

"Implications of Costs of Trucking Livestock," presented to Transportation Committee, American National Cattlemen's Association, San Antonio, Texas

John O. Gerald

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

January 24, 1973

(See Rates and Costs in Agricultural Trucking)

Interstate Trucking of Exempt Agricultural Commodities--
California*

Walter Miklius and D. B. DeLoach

Economic Research Service, U.S. Dept. of Agr., in cooperation with the University of California (Davis), Washington, D.C.

August 1965

Trucks originated or terminated more than 200,000 interstate shipments of exempt agricultural commodities in California in 1963. Inbound shipments were nearly twice as numerous as outbound. Sixty-five percent of the outbound shipments were mixed loads, averaging 5.5 commodities per load. Seventy-four percent of the outbound shipments required more than one pickup to fill the trucks, averaging 2.4 pickups per load and 122 miles in pickup service. Although such shipments reflected less seasonality than did rail shipments, monthly truck shipments in 1961, as a percentage of annual total, varied from less than 7 percent in April to more than 12 percent in July.

Interstate Trucking of Fresh and Frozen Poultry Under Agricultural Exemption*

James R. Snitzler and Robert J. Byrne

Agricultural Marketing Service, U.S. Dept. of Agr.

Washington, D.C.

MRR-224, March 1958

(See Agricultural Exemption in Interstate Trucking)

Interstate Trucking of Frozen Fruits and Vegetables Under Agricultural Exemption*

J. C. Winter and Ivon W. Ulrey

Agricultural Marketing Service, U.S. Dept. of Agr.

Washington, D.C.

Supplement to MRR-316, July 1961

(See Agricultural Exemption in Interstate Trucking)

Interstate Trucking of Frozen Fruits and Vegetables Under
Agricultural Exemption*

James R. Snitzler and Robert J. Byrne
Agricultural Marketing Service, U.S. Dept. of Agr.
Washington, D.C.
MRR-316, March 1959
(See Agricultural Exemption in Interstate Trucking)

Length of Haul to Leading Markets by Motortruck, 1941 and
1950: Selected Fruits and Vegetables*

Margaret R. Purcell
Bureau of Agricultural Economics, U.S. Dept. of Agr.
Washington, D.C.
Unnumbered, June 1953

"Unloads" reports of the U.S. Department of Agriculture for selected fruits and vegetables were used to estimate the average distance of hauls to eight major city markets in 1941 and 1950. The overall average distance increased from 275 miles to 325 miles. By 1950, trucks were the dominant mode for short hauls of all commodities and for all hauls of highly perishable commodities.

Livestock Trucking Services: Quality, Adequacy, and Ship-
ment Patterns

L. A. Hoffman, P. P. Boles, and T. Q. Hutchinson
Economic Research Service, U.S. Dept. of Agr.
Washington, D.C.
AER-312, October 1975

Livestock handlers and feedlot operators are generally satisfied with unregulated trucking services received, according to this 1973 survey. Most cattle or calves arrived in "acceptable," "good," or "excellent" condition. Losses in transit were minimal. Losses resulted most often from poor animal condition prior to loading or trampling in transit. About four-fifths of all shipments moved in for-hire trucks. Seasonality of feeder cattle movements resulted in sharp peaks of demand for livestock trucking services, and some shippers reported trucks to be in short supply during those peak periods. Shippers were generally complimentary regarding the attitude of the trucking firms, promptness of service, skills of the drivers, and quality of equipment furnished. It appears that shippers considered unregulated for-hire truckers to be supplying the livestock industry with satisfactory service at reasonable prices, and there were no

substantial indications that subjecting interstate for-hire service to economic regulation would improve performance for shippers.

Long-Distance Shipment of Market Milk*

William T. Butz
Economic Research Service, U.S. Dept. of Agr.
Washington, D.C.
MRR-648, March 1964
(See Rates and Costs in Agricultural Trucking)

Operations of For-Hire Livestock Trucking Firms

Patrick P. Boles
Economic Research Service, U.S. Dept. of Agr.
Washington, D.C.
AER-343, July 1976
(See Structural and Institutional Attributes of Agricultural Trucking)

Out-of-Market Bulk Milk Shipment Charges for Selected Federal Order Markets

Herbert H. Moede
Economic Research Service, U.S. Dept. of Agr.
Washington, D.C.
MRR-959, May 1972
(See Rates and Costs in Agricultural Trucking)

Over-the-Road Cost of Hauling Bulk Milk

Herbert H. Moede
Economic Research Service, U.S. Dept. of Agr.
Washington, D.C.
MRR-919, January 1971
(See Rates and Costs in Agricultural Trucking)

"Part I: Transportation in Rural America," Prelude to Legislation to Solve the Growing Crisis in Rural Transportation

Prepared by the Economic Research Service, U.S. Dept. of Agr.
U.S. Senate, Committee on Agriculture and Forestry
Washington, D.C.
February 10, 1975
(See Agricultural Exemption in Interstate Trucking)

"Research on Economics of Livestock Transportation," presented to Livestock Transportation Forum, National Livestock Dealers Association, Albuquerque, New Mexico

John O. Gerald
Economic Research Service, U.S. Dept. of Agr.
Washington, D.C.
March 1, 1973
(See Agricultural Exemption in Interstate Trucking)

"Research on Livestock Transportation," presented to the Transportation Committee, American National Cattlemen's Association, Denver, Colorado

John O. Gerald

Economic Research Service, U.S. Dept. of Agr.

Washington, D.C.

January 19, 1972

(See Structural and Institutional Attributes of Agricultural Trucking)

Transportation and Handling of Grain by Motortruck in the Southwest*

William J. Hudson

Production and Marketing Administration, U.S. Dept. of Agr.

Washington, D.C.

Unnumbered, May 1952

(See Rates and Costs in Agricultural Trucking)

Transportation of Cattle in the West*

William N. Capener, and others

Economic Research Service, U.S. Dept. of Agr., in cooperation with the University of Wyoming, Laramie, Wyoming

Research Journal 25, January 1969

(See Rates and Costs in Agricultural Trucking)

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