



**Motor Carrier Industry Profile Study:
Financial and Operating Performance Profiles
by Industry Segment, 2001-2002**

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Executive Summary

This report profiles the motor carrier industry and its significant operating segments. It is one of a series of reports analyzing various aspects of the motor carrier industry. Other reports in the series focus on the safety performance of the industry and its major segments and on the linkage between safety performance and operating performance overall, as well as in each of the industry's major segments.

This report has two primary objectives. The first is to focus on some basic measures detailing the financial performance of for-hire carriers in 11 major industry segments. The second is to compare the operating performance of these industry segments.

Beginning with economic deregulation in 1980 and continuing to the present, the motor carrier industry has undergone a period of change and turmoil. Successful firms have adapted to the new circumstances and have emerged as highly efficient transport providers, leading to remarkable productivity gains and performance improvements in the industry overall.

In large measure, the adaptive carriers have passed along performance and productivity gains to their customers in the form of lower rates and improved services. As a consequence, however, the overall profit profile of the industry has become less attractive to investors because of the generally competitive nature of the industry and because some segments exhibit near-perfect competition. Motor carriers continue to struggle with a number of issues, including consistently low profit margins and high driver turnover.

Several of the individual industry segments appear to be particularly troublesome in terms of investment opportunities, although several others provide investment opportunities above the median for the industry as a whole. The best investment opportunities in 2002 appear to have been among motor vehicle carriers and package couriers, which had higher average returns on transportation investment, higher average returns on equity, and lower average debt-to-equity ratios than the median levels for all carriers combined. The worst investment opportunities seem to have been among the bulk carriers, which had lower average returns on transportation investment, lower average returns on equity, and higher average long-term debt-to-equity ratios than the industry median.

As a result of productivity gains in the 1987-2002 period on the measures of average length of haul, average load, and annual miles per truck, motor carriers were able to control their operating expenses per mile. The productivity gains enabled all carriers to have an average operating expense per mile in 2001 of \$1.93, compared with an average of \$1.99 in 1987. Thus, in actual dollars, the average expense per mile for all carriers decreased between 1987 and 2001—a remarkable testament to the efficiency gains in the industry. In actual dollar terms, the following industry segments had lower average operating expenses per mile in 2001 than in 1987: general freight, heavy machinery, less-than-truckload (LTL), and refrigerated carriers. For the other segments, actual average operating expenses per mile were slightly higher in 2001 than they were in 1987.

There is significant debate about the impacts of leasing versus owning assets on performance in the motor carrier industry. Some firms prefer the leasing option, because its flexibility gives them the ability to adjust capacity to meet market uncertainties. Carriers with owned assets have less flexibility to adjust to the variations in demand that commonly accompany the industry's frequent business cycles. Leased assets have disadvantages relative to owned assets, however, in that motor carriers can lose control over their leased assets. Indeed, leased owner-operator drivers present significant management challenges because, as their name implies, they often are independent and difficult to manage.

The average amount that motor carriers spent on purchased transportation and equipment rentals equaled 25.6% of total operating expenses in 2002. Refrigerated carriers (30.0%) tended to use rental equipment most often and general freight carriers (15.8%) least often in 2002. The industry segment with the highest percentage of truck tractors owned in 2002 (71.7%) was the motor vehicle carriers. The segments with the second highest and third highest tractor ownership percentages were general freight (71.0%) and bulk carriers (71.0%). The segment with the lowest tractor ownership average was refrigerated carriers (53.1%). Overall, the average percentage of vehicle ownership for the industry as a whole in 2002 was 62.6%.

An important public policy question is the extent to which motor carriers overall and in each of the individual segments devote resources to safety-related activities. Unfortunately, the annual data provide few direct measures of the carriers' level of effort with regard to safety. One proxy for safety effort is the percentage of a carrier's operating expenses devoted to insurance. The initial indication is that carriers devoting a higher portion of their expenses to insurance may be making a greater safety effort; however, there is no way to separate out carriers whose high insurance burdens may be a consequence of poor safety records. Overall and across all individual segments, carriers expend between 4% and 5% of their operating expenses on insurance. The segment in 2002 with the lowest percentage of operating expenses devoted to insurance is the package courier group (3.7%), while the segment with the highest percentage (5.0%) is the motor vehicle group.

The motor carrier industry is dynamic and subject to many changes and shifting demands. With bankruptcies continuing at a high rate, it is clear that only those carriers adept at shifting strategies will survive in the long run.

Introduction

This report is the result of a contract between the Federal Motor Carrier Safety Administration (FMCSA) and the Supply Chain Management Center at the Robert H. Smith School of Business. It constitutes a profile of the motor carrier industry and its significant operating segments. It is one of a series of reports analyzing various aspects of the motor carrier industry. Other reports in the series focus on the safety performance of the industry and its major segments and on the linkage between safety performance and operating performance overall and in each of the major segments.

The primary sources of information used in this profile are the Annual Reports filed by 2,363 Class I and II motor carriers with the U.S. Department of Transportation (DOT) for the calendar years 2001¹ and 2002². All interstate for-hire carriers generating \$3 million to \$10million (Class II) or more than \$10 million (Class I) in annual revenues are required to file the financial reports. Class III carriers with less than \$3 million in annual revenues are exempt from filing Annual Reports with the DOT. While the Class I and II motor carriers represent only a small portion of the total number of carriers operating in the United States, these carriers are the largest operators. Their revenues account for a substantial portion of total for-hire carrier revenue, as will be demonstrated in subsequent pages. It should be recognized, however, that some motor carrier firms, including private carriers, do not file Annual Reports with the DOT. As a result, their statistics are not included in this analysis. Furthermore, the American Trucking Associations, Inc. (ATA), in compiling these Annual Reports, does some preliminary audits and omits some carriers from the database due to inaccuracies in reported data.

This report has two primary objectives. The first is to focus on some basic measures detailing the financial performance of the for-hire carriers and the major industry segments. The report identifies the following 11 distinct operating segments: building materials, bulk, general freight, less-than-truckload, household goods, heavy machinery, motor vehicles, other specialized commodities, package courier services, refrigerated, and tank. In addition to a review of basic financial variables, the industry profile study compares each of the 11 segments on a series of operating performance variables.

Industry Overview

Beginning with economic deregulation in 1980 and continuing to the present, the motor carrier industry has undergone a period of change and turmoil. In the initial years after deregulation, a number of firms failed to adjust to the realities of a competitive environment and went bankrupt. Indeed, the process of adaptation and innovation has been a constant requirement for motor carrier firms throughout this period. Also remaining constant throughout the period has been the bankruptcy of firms failing to adjust to the new environmental realities. In 2002, there were

¹ **Motor Carrier Annual Reports 2001: Comprehensive Financial and Operating Statistics for Class I and II Carriers**, Published by Transport Topics Press, American Trucking Associations, Inc., 2002.

² **Motor Carrier Annual Reports 2002: Comprehensive Financial and Operating Statistics for Class I and II Carriers**, Published by Transport Topics Press, American Trucking Associations, Inc., 2003.

2,374 motor carrier business failures.³ However, throughout the period, surviving firms and some new entrants have adapted to the new circumstances and have emerged as highly efficient transport providers. Indeed, the overall industry's productivity gains and performance improvements have been nothing short of remarkable.

In large measure, the adaptive carriers have passed along these performance and productivity gains to their customers in the form of lower rates and improved services. As a consequence, despite these productivity and efficiency gains, the overall profit profile of the industry is unattractive for the investor community. This is generally due to the competitive nature of the industry and the fact that some segments exhibit something close to perfect competition. Motor carriers continue to struggle with a number of issues such as consistently low profit margins and high driver turnover.⁴

The motor carrier industry in its entirety, i.e., private and for-hire (Class I, II, and III) carriers, represents 87% of the commercial freight distribution in the United States, with 2002 revenues of more than \$585 billion.⁵ Motor carrier transport provides direct origin-to-destination services for the U.S. manufacturing and services industries and is an integral part of providing coordinated pickup and delivery services for air cargo and ocean container cargo as well.

Table 1 provides a distribution of commercial freight revenues across each of the modal segments for years 2001 and 2002.⁶ The total transportation freight bill decreased from \$713.6 billion in 2001 to \$676.6 billion in 2002, reflecting the Nation's economic downturn during that period. Of the 2002 total, the trucking industry's contribution also decreased from \$610.2 billion to \$585.3 billion. The largest individual portion in 2001 belonged to truckload for-hire carriers with \$273.9 billion in revenues or 38.4% of the total. Many firms handle freight for their own supply chains, with limited or no for-hire operations. In 2002, private trucking surpassed for-hire carriers and accounted for 40.9% of the total commercial transportation dollar or \$276.7 billion. It should be noted that, in contrast to for-hire commercial trucking operations, the private carriers do not receive direct payments for their services. Many firms account for these transportation services through internal charge-back accounting entries. A third important component of the trucking total is a result of less-than-truckload for-hire transportation.

Table 2 distributes the total revenue and the number of Class I and II for-hire firms across each of the major industry segments. As shown, the 2,250 firms accounted for in Table 2 generated \$93 billion in total revenues in 2002.⁷ Thus, the \$93 billion in revenues generated by these 2,250

³ American Trucking Associations, Inc., **American Trucking Trends 2003**, American Trucking Associations, Alexandria, VA, 2003, p. 12.

⁴ Source: ICF Consulting, **Evaluation of US Commercial Motor Carrier Industry Challenges and Opportunities**, March 31, 2002, p. 4.

⁵ Jim Corridore, Standard and Poor's Industry Surveys, **Transportation: Commercial**, Dec. 25, 2003, p. 8. Sources cited by Standard and Poor's: Cass Information Systems and Standard and Poor's own estimates.

⁶ Jim Corridore, Standard and Poor's Industry Surveys, **Transportation: Commercial**, Vol. 171, No. 25, Section 2, Dec. 25, 2003, p. 8.

⁷ Author's calculations from Motor Carrier Annual Report, 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CD of Annual Report data for calendar year 2002.

firms account for approximately 28% of the revenues generated by all truckload firms (\$276.7 billion) and all less-than-truckload firms (\$58.4 billion) combined.

Table 1: Commercial Freight Distribution, 2001-2002

Transportation Mode	2001 Billions \$	2001 % of Total	2002 Billions \$	2002 % of Total
Trucking , total	610.2	85.5	585.3	86.5
◆ Private Trucking	273.6	38.3	276.7	40.9
◆ Truckload	273.9	38.4	250.2	37.0
◆ Less-than-Truckload	62.7	8.8	58.4	8.6
Railroad	35.4	5.0	34.7	5.1
Rail Intermodal	6.7	0.9	7.8	1.2
Pipeline (oil and gas)	27.2	3.8	26.9	4.0
Airfreight	26.0	3.6	14.1*	2.1*
Water (Great Lakes/rivers)	8.1	1.1	7.8	1.2
Transportation Total	713.6	100.0	676.6	100.0

Source: Jim Corridore, Standard and Poor's **Industry Surveys, Transportation: Commercial**, June 19, 2003, p. 8, and Dec. 25, 2003, p. 8. Sources cited by Standard and Poor's: Cass Information Systems and Standard and Poor's own estimates.

*Air Freight was classified differently for 2002.

Table 2: Distribution of Revenues and Firms Across Major Segments of the Trucking Industry, 2002

Industry Segment	Revenues in Billions \$	Percent of Total Revenues	Number of Firms	Percent of Total Firms
Building Materials	2.8	3.0	47	2.1
Bulk	1.5	1.6	86	3.8
General Freight	47.6	51.3	1,182	52.5
Less-than-Truckload	19.9	21.4	155	6.9
Household Goods	4.6	5.0	80	3.6
Heavy Machinery	2.9	3.1	80	3.6
Motor Vehicles	0.7	0.8	25	1.1
Other Specialized	5.9	6.4	322	14.3
Package Courier	0.2	0.2	14	0.6
Refrigerated	3.5	3.8	129	5.7
Tank	3.1	3.4	130	5.8
Total	92.9	100.0	2,250	100.0

Source: Author's calculations from Motor Carrier Annual Report, 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CD of Annual Report data for calendar year 2002.

Table 2 shows that in 2002 the general freight truckload carriers generated 51.3% of the total revenues of the reporting Class I and Class II carriers. These carriers represent over half of the total number of Class I and II carriers. The second largest revenue-generating industry segment is the less-than-truckload segment. Although this segment represents only 6.9% of the total number of carriers reporting, they are responsible for 21.4% of the total revenues from the Class I and II carriers.

The remainder of this industry profile is divided into two sections. One covers basic financial variables and discusses differences among the individual industry segments on these important measures. The second focuses on operating variables and assesses differences in performance across the individual segments.

Financial Profile

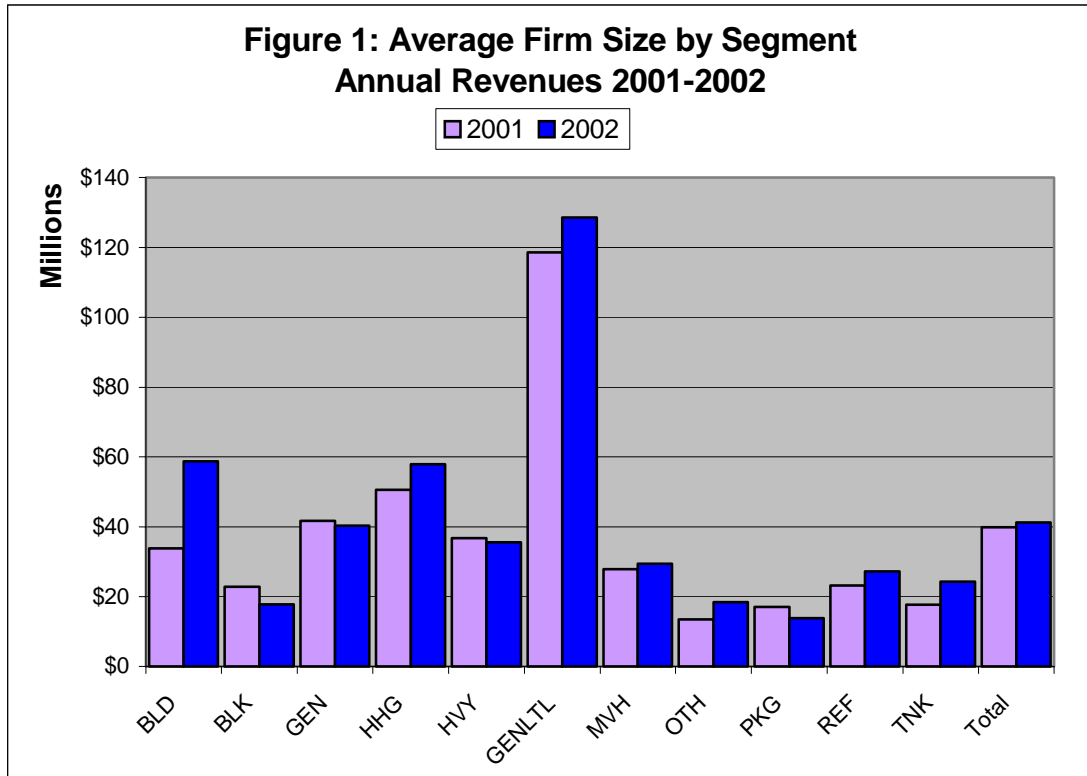
Although the motor carrier industry continues to grow and increase revenues, the overall profitability of the industry remains low. This financial profile of the motor carrier industry and its segments is divided into the following subsections: firm size and revenue concentration; profitability; investment profile; and revenue profile. The objective is to compare each of the industry segments on measures of size and revenue concentration, on measures of profitability (operating ratio and net profit margin), on measures of investment opportunity (return on transportation investment, return on equity, and long-term debt-to-equity ratio), and on measures of revenue generating potential (revenue per mile and revenue per ton). Throughout the text, we will use the legends for each segment that are defined immediately below.

Legend for Industry Segments			
BLD	Building Materials	MVH	Motor Vehicles
BLK	Bulk	OTH	Other Specialized
GEN	General Freight	PKG	Package Courier
GENLTL	Less-than-Truckload	REF	Refrigerated
HHG	Household Goods	TNK	Tank
HVY	Heavy Machinery		

Firm Size and Segment Concentration

Figure 1 displays the 2001 and 2002 average annual revenues for each of the industry's segments. Table 3 provides information on the concentration of each segment's total revenues generated by its top three firms for 2002 and also identifies the top three revenue-generating firms in each of the industry's segments.

Overall, among the 2,250 Class I and II firms in the database, the average firm size, based on 2002 annual operating revenues, is \$41 million. The following three segments exceeded this overall average in 2002 (with average annual revenue in parentheses): less-than-truckload (\$129 million), building materials (\$59 million), and household goods (\$58 million) (Figure 1). The following eight segments were below the overall average annual revenues for all firms in the database: general freight (\$40 million), heavy machinery (\$36 million), motor vehicles (\$29 million), refrigerated (\$27 million), tank (\$24 million), other specialized carriers (\$18 million), bulk (\$18 million), and package freight (\$14 million).



Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.

Table 3 addresses the issue of revenue concentration, namely, the portion of an industry segment's total revenues that are concentrated among its top three firms. Across all of the 11 segments in 2002, the average concentration percentage for the largest three firms in a segment equaled 42%. However, the segments with the highest concentration of revenues among the top three firms were among the segments of the industry with the smallest share of total revenues. In fact, the three segments with the highest concentration percentages generated only 6.9% of the total revenues generated by the 2,250 firms in the database. The building materials segment had a concentration ratio of 84.1%, while the heavy machinery segment had a concentration ratio of 64.1% and the motor vehicles had a concentration ratio of 56.6%.

The segments with very low concentration rates are the following (with the three-firm concentration ratios in parentheses): tank (23.8%) and bulk carriers (17.2%). The two largest industry segments (in terms of total revenues) had modest concentration ratios, with the less-than-truckload concentration ratio equal to 35.8% and the general freight truckload ratio equal to 47.3%. It should be noted with emphasis that since the end of 2001, there has been significant turmoil in the less-than-truckload segment. Indeed, Consolidated Freightways, the segment's third largest carrier, has ceased operations, while its top two firms, Roadway Express, Inc. and Yellow Freight Transportation, Inc., have announced merger plans set for implementation in the spring of 2004 under the name Yellow Roadway Corp.

Table 3: Market Share Concentration by Industry Segment, 2001-2002

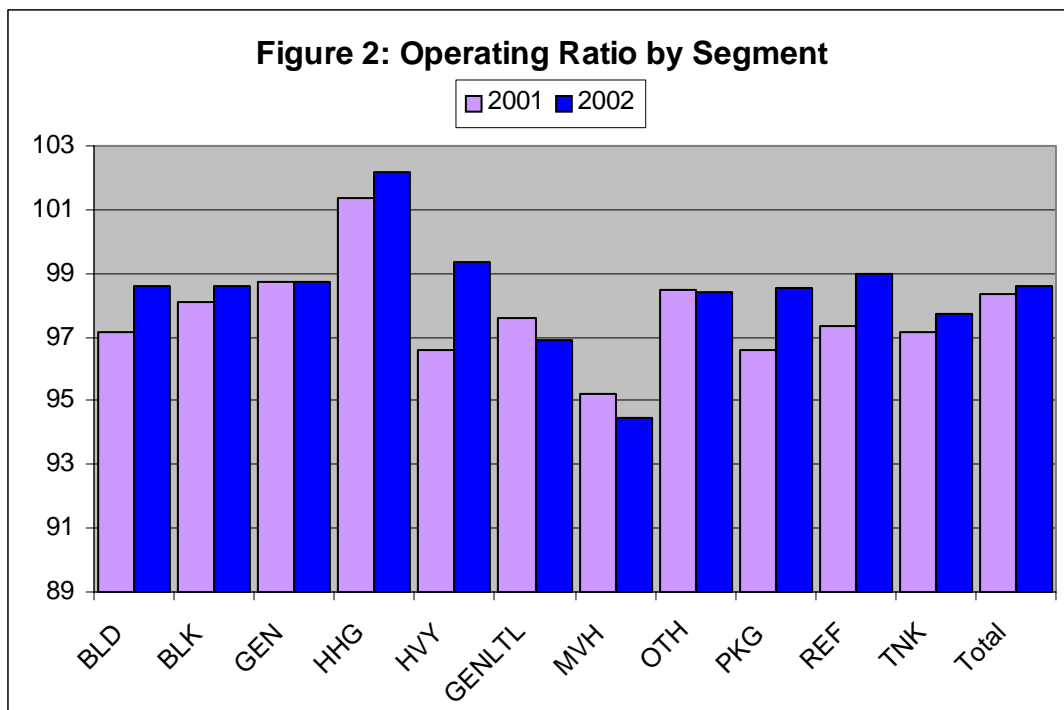
Industry Segment	Share of Total Segment Revenues by Top Three Firms		Three Largest Firms in Each Segment (on basis of Total Annual Revenues for 2002)
	2001	2002	
Building Materials	73.6%	84.1%	Swift Transportation Company, Swiftway Motor Express, Fleetwood Transportation Services
Bulk	31.1%	17.2%	Bulkmatic Transport Company, Schwerman Trucking Company, Kephart Trucking Company
General Freight TL	44.8%	47.3%	United Parcel Service (Ohio), United Parcel Service (NY), J. B. Hunt Transport
Less-than-Truckload	33.4%	35.8%	Roadway Express, Yellow Freight Transportation, Con-Way Transportation
Household Goods	44.2%	45.8%	United Van Lines, North American Van Lines, Allied Van Lines
Heavy Machinery	63.1%	64.1%	Ryder Integrated Logistics, Ace Transportation, Truckers Express
Motor Vehicles	51.6%	56.6%	Cassens Transport Company, Jack Cooper Transport Co., Hadley Auto Transport
Other Specialized	13.5%	33.7%	New Bern Transport, Penske Logistics, Canam Steel Corp.
Package Courier	56.1%	52.2%	Network Courier Services, United Couriers Inc., Land Air Express Inc.
Refrigerated	33.5%	36.3%	New Prime Inc., CR England, Marten Transport Ltd.
Tank	16.8%	23.8%	Quality Carriers, Kenan Transport Company, Groendyke Transport.

Table 3 provides a listing of the names of the top three revenue-generating firms in each of the industry's 11 segments. There are some important considerations in this list. First, United Parcel Service, Inc. (UPS), with its headquarters in Atlanta, Georgia has two separate Interstate Commerce Commission (ICC) numbers and files two separate Annual Reports to the DOT. Although UPS generates a significant portion of its revenues from less-than-truckload operations, it does not report less-than-truckload revenues separately. For this analysis, firms were identified as less-than-truckload only if at least one-half of their total operating revenues resulted from less-than-truckload activities. Since UPS did not identify its revenues as being truckload or less-than-truckload, it was included in the general freight truckload segment for this analysis. It should also be noted that UPS consolidates its shipments into truckload quantities for line-haul movements and is one of the railroad's largest customers for piggyback operations.

Second, each firm is categorized into a single industry segment. However, over the years many firms have expanded their operations and now have different divisions that are active in one or more of the industry segments. However, for this analysis, each firm is put into a single category based on the assessment by the ATA's data analysts as to the single most appropriate industry segment. With these caveats in mind, Table 3 presents the names of the leading three firms (on the basis of total annual revenues) in each of the industry's 11 segments.

Profitability

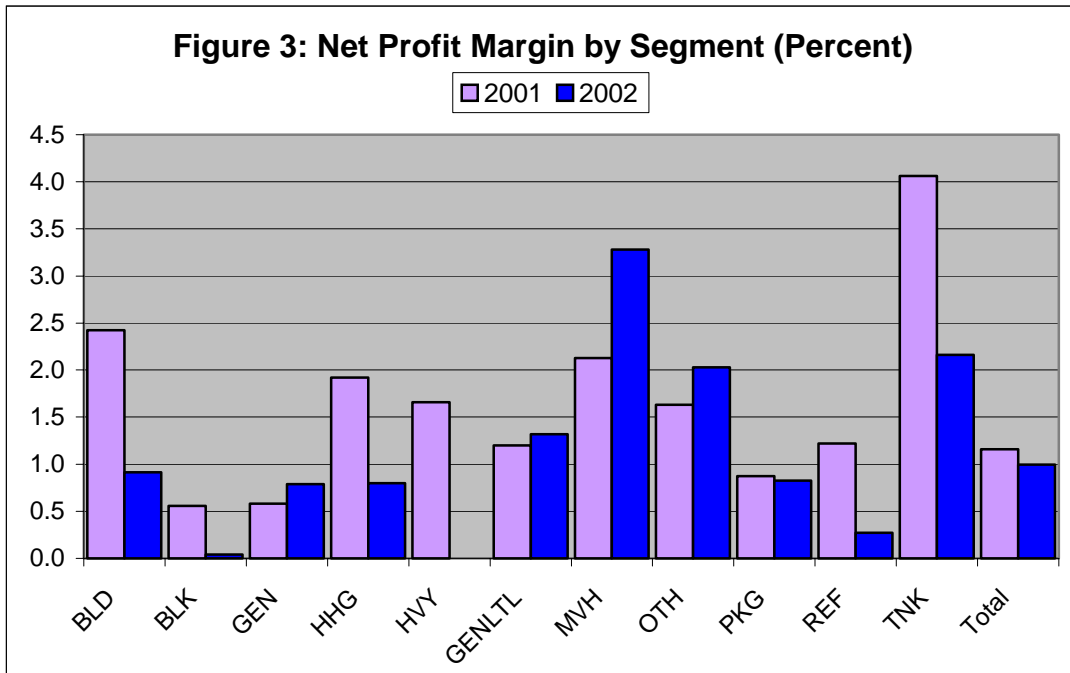
This section focuses on two measures of industry profitability: operating ratio and net profit margin. Operating ratio is defined as total operating expenses divided by total operating revenues, while net profit margin is net income (income after taxes) divided by total operating revenues. Figure 2 displays the operating ratio averages for 2001 and 2002 for all motor carriers in the database combined and for each of the individual segments. Figure 3 provides data on net profit margin averages for the same years for all motor carriers combined and for each of the individual segments. Table 4 lists the three firms in each industry segment with the highest net profit margins.



Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.

The average operating ratio (Figure 2) in 2001 for the 11 industry segments ranged from a low of 95.2 for motor vehicles to a high of 101.4 for household goods. This range increased in 2002 with a low of 94.5 for motor vehicles and a high of 102.2, again for household goods. The average operating ratio across segments was 98.3 in 2001 and increased to 98.6 in 2002.

The net profit margin across all firms in 2002 averaged 0.99%, a decrease from 2001 when net profit margin across segments was 1.16%. The largest industry segment by total revenue, general freight, had a net profit margin of only 0.79% for 2002. There were only three segments with a net profit margin average higher than 2.0%: building materials, other specialized, and motor vehicles. Table 4 provides a list of the three firms in each segment with the highest net profit margins for 2001 and 2002.



Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002. Note: Net profit margin for heavy machinery (HVY) in 2002 was -0.83%.

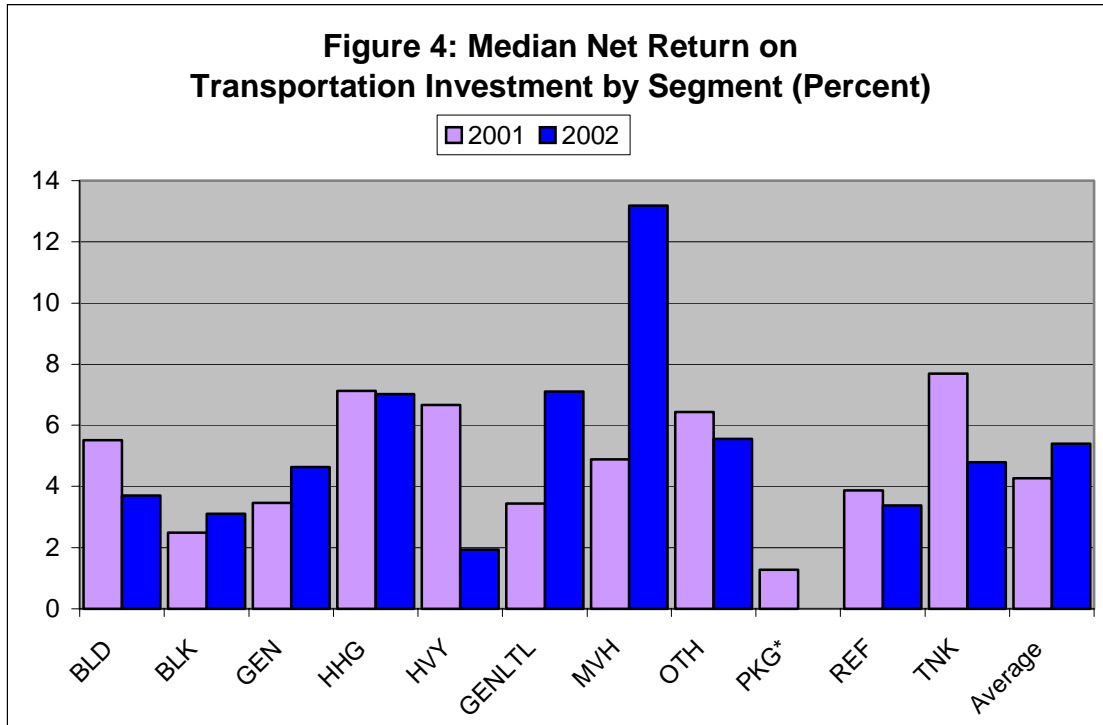
Investment Profile

This analysis provides three measures of the investment profile of the motor carrier industry: net return on transportation investment, return on equity, and long-term debt-to-equity ratio. The breakdown of performance for all carriers combined as well as for each of the individual segments is shown in Figure 4 (net return on transportation investment), Figure 5 (return on equity), and Figure 6 (long-term debt-to-equity ratio). Due to the existence of extreme outliers in the database, reported values in each of these figures are based on median values as opposed to mean values. The median value is a more representative value and is less influenced by outliers than is a mean value. The median value, as such, is a better measure of central tendencies.

Table 4: Firms with Highest Net Profit Margins by Segment

Industry Segment	Three Firms with Highest Net Profit Margin	
	2001	2002
Building Materials	Great Southern Wood Pres. Holley Transport Inc. Pitts., Verona, Oakmont Exp.	Ancon Transportation Services F V Martin Trucking Co. Excel Transport Inc.
Bulk	CBSL Transportations Serv. Perdido Trucking Service LLC Metro Companies Inc	Barney Trucking Robinson Transport Richard McNay Inc.
General Freight TL	Seneca Beverage Corp Hardy Brothers Inc. Al's Leasing Inc.	Hecla Machinery & Equipment G & J Land & Marine Food Dist. WC Fore Trucking Co.
Less-than-Truckload	North Park Transportation Keller Transfer Line Inc. MJB Freight Systems	Price Transportation MJB Freight Systems NFC Inc.
Household Goods	Golans Moving & Storage Inc. Time Moving & Storage Inc A & A Transfer & Storage	Ruseell Yarbrough Moving Prestige Moving & Storage Continental Can Lines
Heavy Machinery	Manhatt Inc Britt Trucking Company V Van Dyke Inc	V Van Dyke Inc Merrell Brothers RW Jones Trucking
Motor Vehicles	Tropical Auto Transport GST Transport Systems Inc. Anderson Consulting Inc	Charles Deinum Inc. Trans. GST Transport Systems Inc. Auto Trans Co. of California
Other Specialized	Mo Vac Service Co. Inc. Bo-Mark Transport Inc. Dalbo Inc.	San Joaquin Valley Express Antonni Freight Express Motor Carries Service
Package Courier	City Dash Inc. Bulloch & Bulloch Inc. Coastal Courier Inc.	City Dash Inc. New Courier Inc. Bulloch & Bulloch Inc.
Refrigerated	Edens Dist Co. Inc. Montana Brand Produce Co. Western Ref. Freight Systems	Taylor Distributing PBX Inc. Sillers Bros. Construction
Tank	Seminole Trans. & Gathering San Joaquin Valley Express Swiftly Transportation Inc.	Swiftly Transportation Transgas Inc. Reliable Tank Line

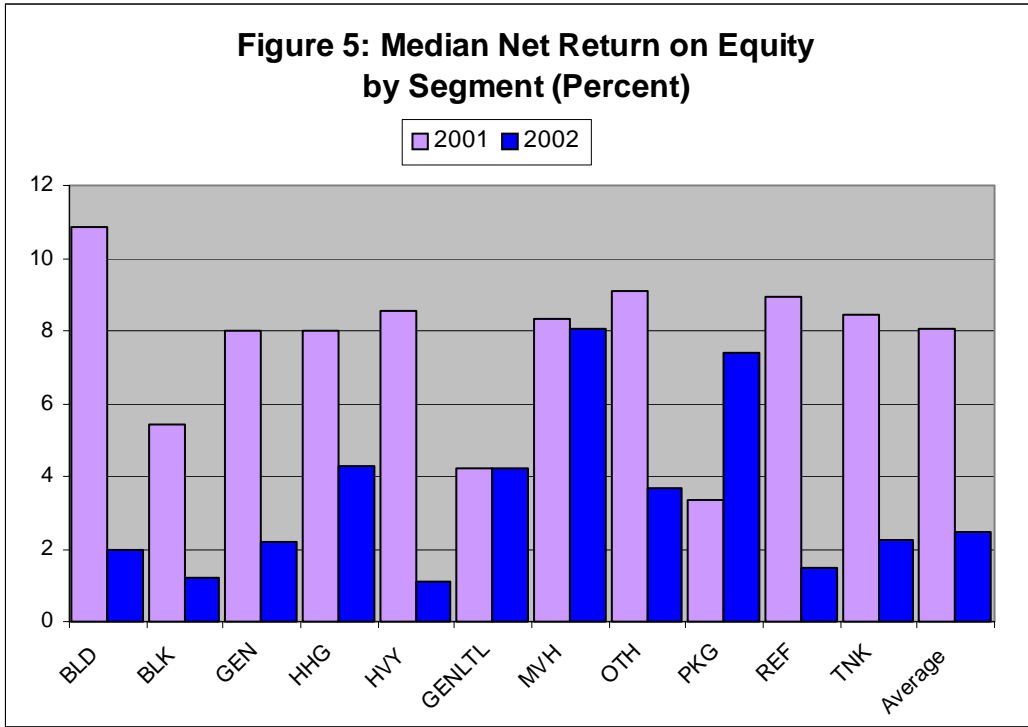
Figure 4 shows the median values for net return on transportation investment for all carriers taken together as well as for each of the individual segments. As shown, overall, the median net return on transportation investment for all carriers taken together was 4.3% in 2001 and 5.0% in 2002. The median net return on transportation investment in 2002 exceeded the overall median for the following industry segments (with median return in parentheses): motor vehicles (13.2%), package couriers (12.6%), less-than-truckload (7.1%), household goods (7.0%), and other specialized commodities (5.5%). Three segments displayed significant improvement in 2002 over 2001, with motor vehicles, package couriers and less-than-truckload improving their median return on transportation investment. Heavy machinery and the tank segment experienced sharp declines in 2002.



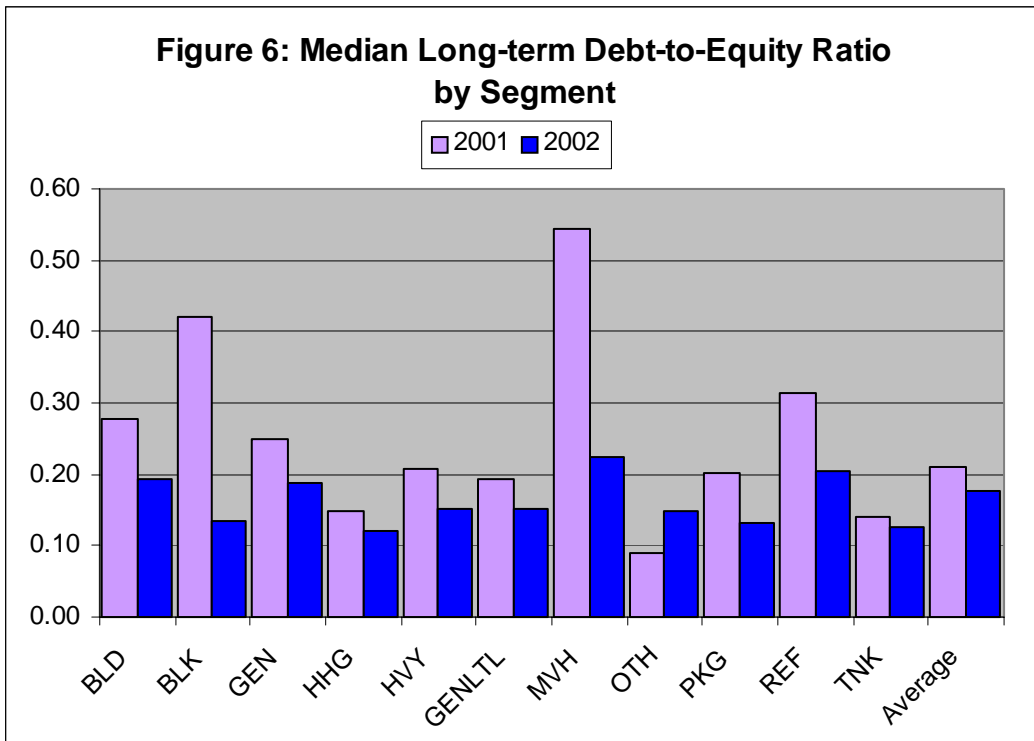
Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.
 *Insufficient data for 2002.

Figure 5 focuses on the median return on equity for all carriers taken together as well as for carriers in each of the individual segments. The median return on equity for all carriers taken together fell from 8% in 2001 to 5.4% in 2002. The median return on equity in 2002 ranged between 1% and 4% for the following nine segments (with median return in parentheses): heavy machinery (1.1 %), bulk (1.2%), refrigerated commodities (1.5%), building materials (2.0%), general freight truckload (2.2%), tank (2.5%), other specialized commodities (3.7%), less-than-truckload (4.2%), and household goods (4.3%). The median return on equity in 2002 was higher for two specific segments: package goods (7.4%) and motor vehicles (8.0%).

Figure 6 presents the median values for the long-term debt-to-equity ratios for the industry segments as well as for the entire set of carriers in the database. Over all firms, the 2002 median debt-to-equity ratio is 0.18—i.e., 18 cents of long-term debt for every dollar of owner's equity or capital. Seven of the individual segments had debt-to-equity ratios in 2002 below the overall median and four had debt-to-equity ratios above the overall median. The segment with the highest median debt-to-equity ratio is the motor vehicle segment and the one with the lowest median debt-to-equity ratio is the household goods segment.



Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.



Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.

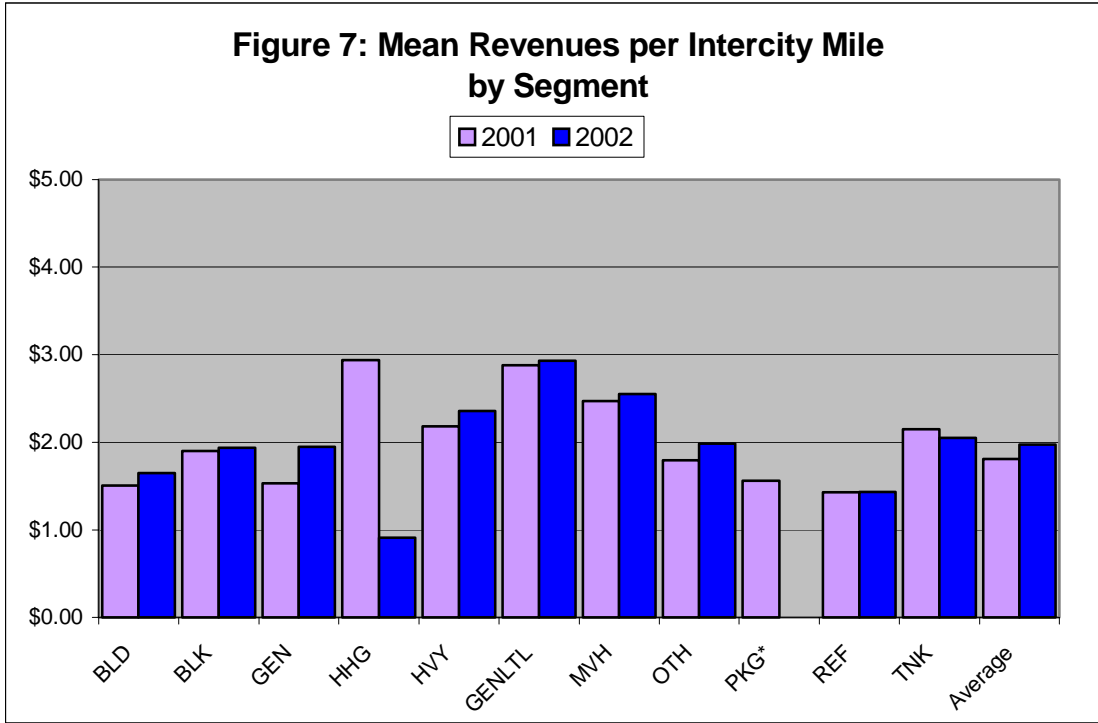
An overall assessment of this investment profile section suggests that several of the individual industry segments appear to provide particularly troublesome investment opportunities, while several provide investment opportunities above the median for the industry as a whole. The best investment opportunities in 2002 appear to lie among motor vehicle carriers and package couriers. Indeed, the motor vehicle carriers and package couriers have a higher than average median return on transportation investment and return on equity with a low debt-to-equity ratio. The worst investment opportunities seem to rest with the bulk carriers whose net return on transportation investment and return on equity are below the median levels for all carriers combined. In addition, bulk carriers have a high median long-term debt-to-equity ratio.

Revenue Profile

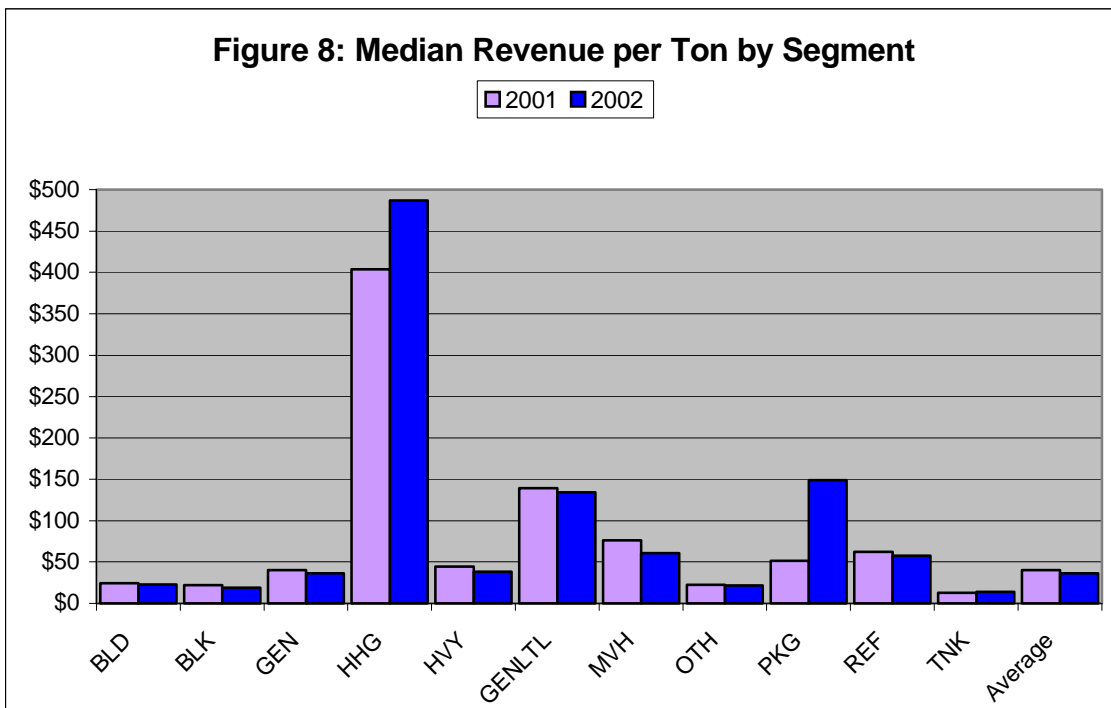
This analysis uses the following two measures of the revenue generating potential of motor carriers overall and for each of the industry segments: revenue per mile (Figure 7) and revenue per ton (Figure 8). Each of these measures addresses the ability of motor carriers to generate revenues either on the basis of the distance they transport commodities (revenue per mile) or on the basis of the amount of freight they carry (revenue per ton).

Figure 7 reports average revenue per mile for all the carriers in the database taken together as well as for carriers in each of the individual segments. As shown, for all carriers combined, the average revenue per mile in 2002 is \$1.98. The highest average revenue per mile is for the less-than-truckload segment with a 2002 figure of \$2.93 per mile followed by the motor vehicle carriers with a figure of \$2.55. Additionally, carriers in the following segments had average revenue per mile in excess of \$2.00: motor vehicles, heavy machinery, and tank.

Figure 8 shows median revenue per ton for all carriers combined and for each of the individual industry segments. For this revenue variable, the median value is shown, as opposed to the mean value. Again, the justification for use of the median as opposed to the mean stems from the existence of outliers on this measure. By including outliers in the measure of central tendency, results are skewed. A far better central tendency measure in view of the outliers is the median value. Thus, among all carriers combined the median revenue per ton in 2002 is \$36.15. However, household goods carriers in 2002 have median revenue per ton of \$486.92. This reflects the inclusion of loading and unloading services along with a series of ancillary charges in connection with an interstate move. Package carriers have the second highest 2002 median revenue per ton with a value of \$148.87. Carriers in the following segments have median revenues below the median revenue per ton for all carriers combined (with 2002 revenue per ton median figures in parentheses): building (\$22.60), bulk (\$18.58), other specialized commodities (\$21.61), and tank operators (\$13.79).



Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.
 *Insufficient data for 2002.



Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.

Operating Performance Profile

This section of the report assesses the operating performance of the motor carrier industry overall as well as in each of its major segments. The discussion begins with an assessment of the following set of productivity measures: average length of haul, average load, annual miles per driver, and annual miles per truck. Significant productivity enhancements by the industry overall and in most segments on these measures have enabled motor carriers to hold down their costs over the past 15 years. The second operating performance section deals with employee/driver compensation and reports average compensation levels for all carriers taken together as well as for carriers in each industry segment. The third section addresses the lease versus buy issue and measures the extent to which carriers taken together and in each of the segments rely on leased equipment and labor for their operations. A final section looks at insurance expenses by carriers as a percent of total operating expenses. This variable—insurance expense—serves, to some extent, as a proxy for safety expenditure effort by the carriers.

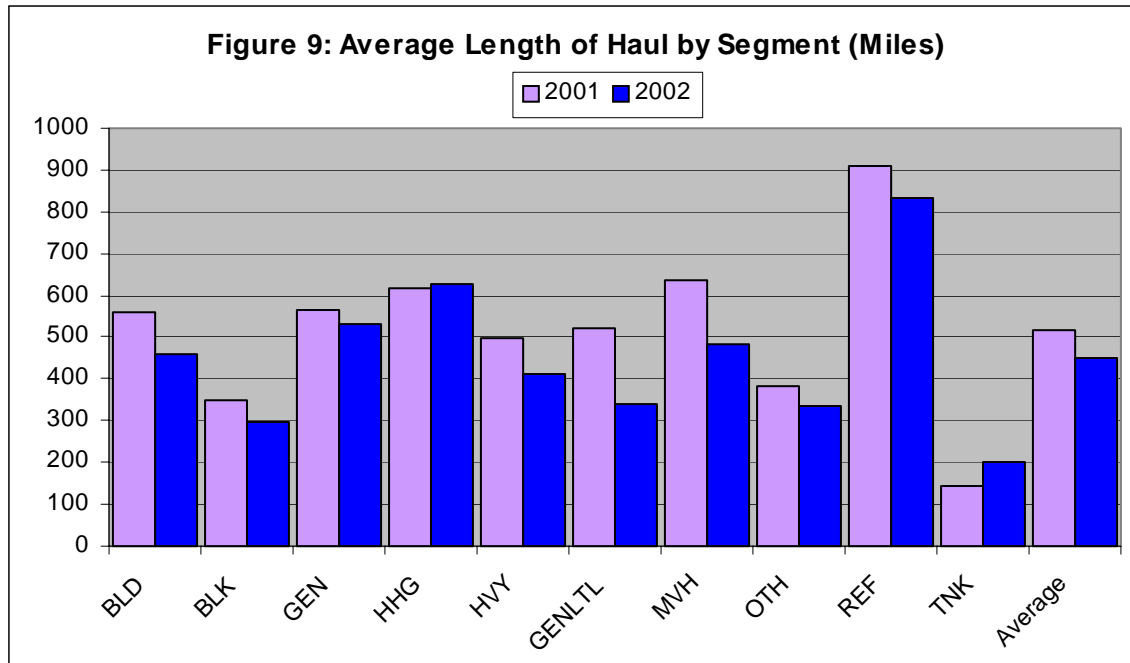
Productivity Measures

Figures 9 through 12 focus on various productivity measures and display mean performance on each measure for all carriers taken together as well as for carriers in each of the industry segments. The specific measures examined are the following: average length of haul (Figure 9), average load (Figure 10), average annual miles per driver (Figure 11), and average annual miles per truck tractor and straight tractor (Figure 12).

Figure 9 focuses on average length of haul as a productivity measure. For all carriers taken together the average length of haul in 2002 equaled 452 miles. Tank carriers had average haul lengths that were much shorter than the average for all, with an average haul length of only 203 miles. Refrigerated carriers had an average length of haul of 833 miles, the longest average length of haul among all the various carrier segments.

Table 5 demonstrates that carriers in all but one industry segment (other specialized commodities) increased average length of haul between 1987 and 2002. For all carriers combined the average length of haul increased from 380 miles in 1987 to 469 miles in 2002, an increase of 23%. Among the truckload general freight carriers, the average length of haul increased from 313 to 531 miles between 1987 and 2002. Among the refrigerated carriers, the average length of haul increased from 727 to 833 miles.

There are various explanations for the observed increases in average lengths of haul. Perhaps the best is one that combines the increases in average loads with the increases in average lengths of haul. Indeed, there is a greater frequency for truckload carriers in 2002 to combine multiple loads in a single truckload movement with multiple drop points to achieve operating efficiencies and to reduce the frequency of empty dead trips. The multiple-load trip reduces transaction costs as well as wait times between trips.



Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.

Table 5: Average Haul Length (in miles) Across Major Industry Segments, 2002 and 1987

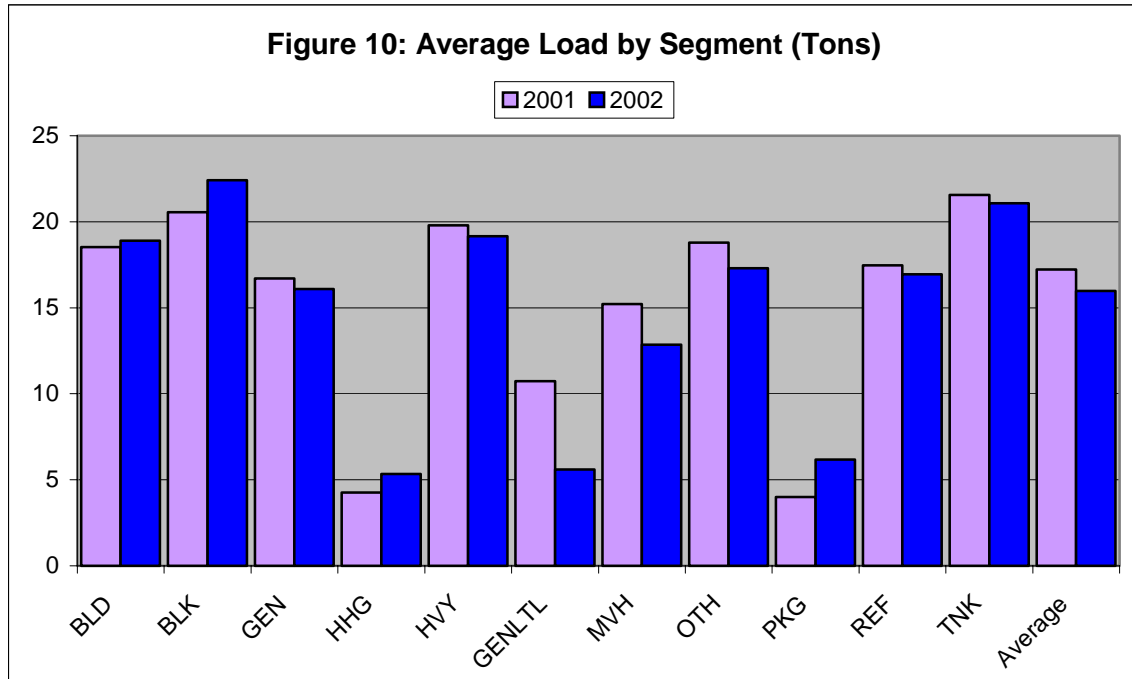
Industry Segment	Calendar Year 2002	Calendar Year 1987
Building Materials	459	312
Bulk Commodities	295	272
General Freight	530	313
Less-than-Truckload	339	313
Household Goods	628	
Heavy Machinery	414	411
Motor Vehicles	483	294
Other Specialized Commodities	337	393
Refrigerated Commodities	833	727
Tank	202	143
All Carriers Combined	469	380

Source: 1987 data cited in Thomas M. Corsi and Joseph R. Stowers, "Effects of a Deregulated Environment on Motor Carriers: A Systematic, Multi-Segment Analysis," *Transportation Journal*, Vol. 30, No. 3, Spring 1991, p. 20. Data from 2001 based on Author's calculations from Motor Carrier Annual Report, 2001, American Trucking Associations, Alexandria, Virginia.

*This table appears in Thomas M. Corsi, "The Truckload Carrier Industry Segment," *Trucking in the Age of Information*, Dale Belman, editor, Ashgate Publishing, forthcoming 2004.

Figure 10 shows the average loads for all carriers combined as well as for carriers in each of the major industry segments. Overall, carriers in 2002 had an average load of 16.0 tons. Carriers in the following seven segments exceeded this average load (with average load for 2002 in parentheses): bulk (22.4 tons), tank (21.1), heavy machinery (19.2 tons), building materials (18.9 tons), other specialized commodities (17.3 tons), refrigerated commodities (17.0 tons), and

general freight (16.1). The following three segments carried loads significantly lighter than other carrier segments in 2002: package couriers (6.2 tons), less-than-truckload (5.6 tons), and household goods (4.3 tons).



Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.

Between 1987 and 2002, all carriers combined increased their average load from 13.1 to 16.0 tons (Table 6). The average load increased for carriers in each individual industry segment, except for less-than-truckload, during this time period. The general freight truckload carriers increased their average load from 13.2 tons in 1987 to 16.1 tons in 2002. The comparable figures for bulk carriers are 13.7 tons in 1987 and 22.4 tons in 2002.

The average annual total miles driven per driver for all carriers combined was 82,387 miles for 2002 (Figure 11). The range for the industry varied from lows of 57,524 miles for less-than-truckload and 60,236 miles for household goods carriers to highs of 107,380 miles for the refrigerated segment and 99,635 miles for the building materials segment.

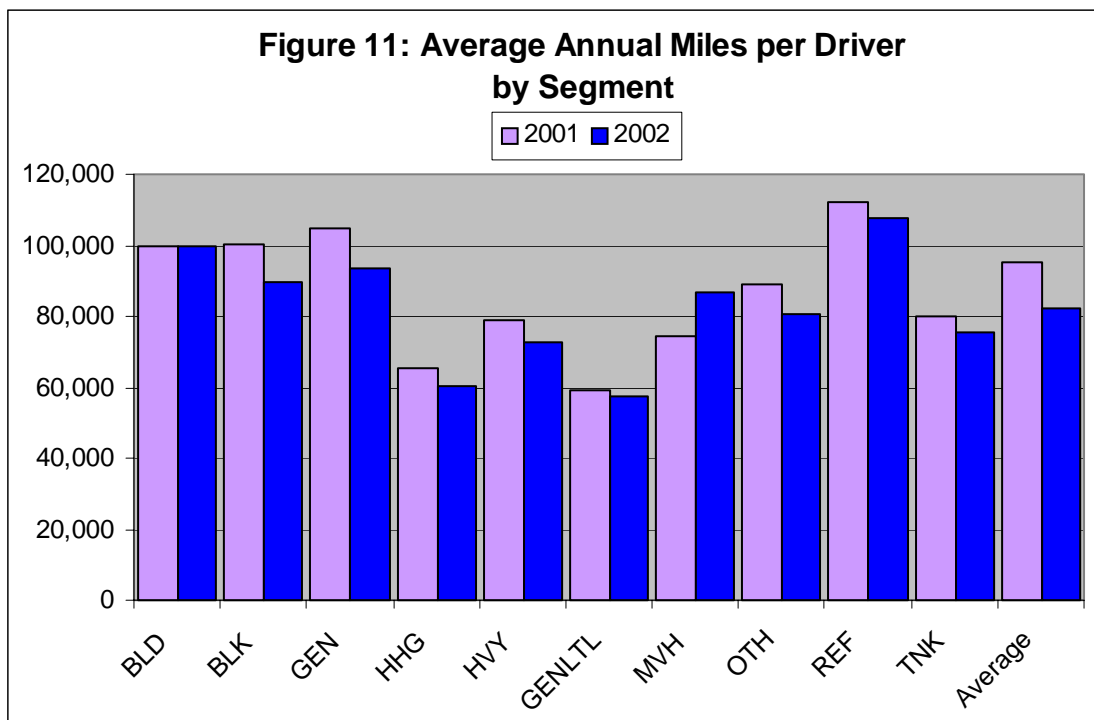
Figure 12 focuses on the average annual total miles driven per truck tractor and straight tractor. Among all carriers combined, the average annual miles for 2002 totaled 83,563 miles. The average annual miles ranged from a low of 59,925 miles for the household goods segment and 70,145 miles for the less-than-truckload segment to a high of 132,577 miles for the package couriers and 111,455 for the refrigerated segment.

Table 6: Average Load Across Major Industry Segments, 2002 and 1987 (Tons)

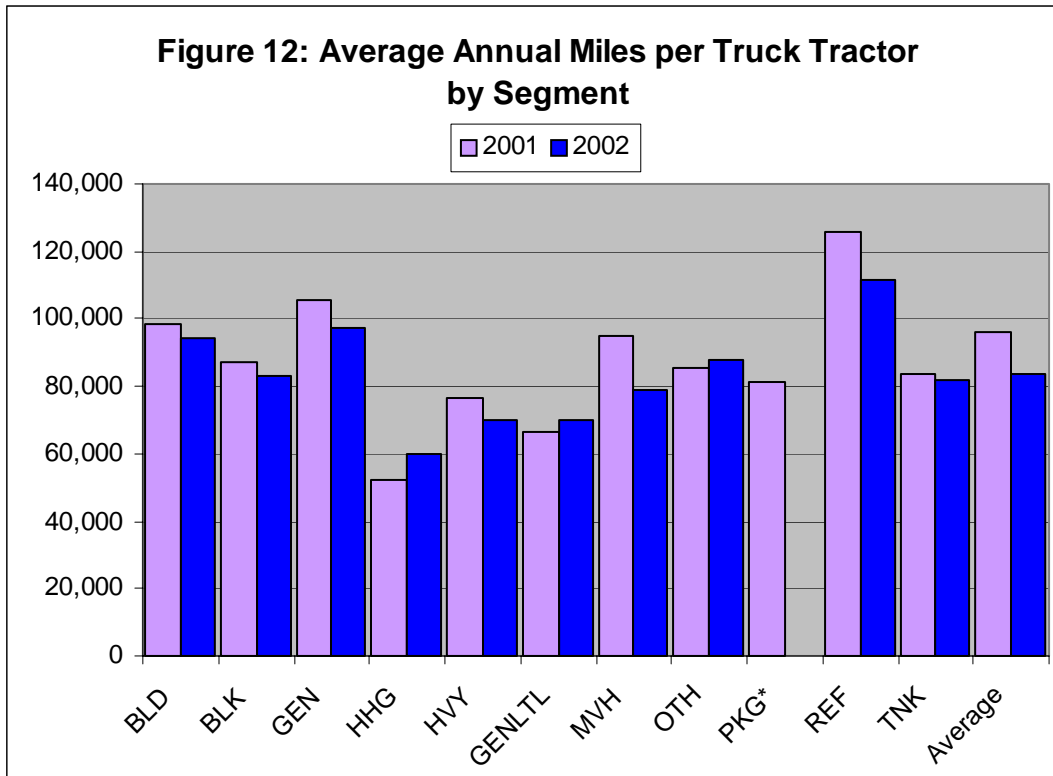
Industry Segment	Calendar Year 2002	Calendar Year 1987
Building Materials	18.9	15.4
Bulk Commodities	22.4	13.7
General Freight	16.1	13.2
Less-than-Truckload	5.6	9.7
Household Goods	5.3	
Heavy Machinery	19.2	12.4
Motor Vehicles	12.9	8.1
Other Specialized Commodities	17.3	13.6
Refrigerated Commodities	16.9	14.5
Tank	21.1	15.4
All Carriers Combined	16.0	13.1

Source: 1987 data cited in Thomas M. Corsi and Joseph R. Stowers, "Effects of a Deregulated Environment on Motor Carriers: A Systematic, Multi-Segment Analysis, *Transportation Journal*, Vol. 30, No. 3, Spring 1991, p. 20. Data from 2001 based on Author's calculations from Motor Carrier Annual Report, 2001, American Trucking Associations, Alexandria, Virginia.

This table appears in Thomas M. Corsi, "The Truckload Carrier Industry Segment," *Trucking in the Age of Information*, Dale Belman, editor, Ashgate Publishing, forthcoming 2004.



Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.



Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.
*Insufficient data for 2002.

Between 1987 and 2002, the average annual miles per truck across the entire set of carriers increased from 65,700 to 83,563, an increase of nearly 27%. In fact, increases occurred in every industry segment. Among the general freight truckload carriers, the average annual miles per truck increased from 73,400 in 1987 to 97,441 in 2002. Among the refrigerated truckload carriers, the average miles per truck went from 90,900 in 1987 to 111,455 in 2002.

As a result of productivity gains in the 1987-2002 period on the measures of average length of haul, average load, and annual miles per truck, the motor carriers were able to control their operating expenses per mile. Table 8 presents a comparison of operating expenses per mile for each segment of the industry between 1987 and 2002. The operating expenses per mile figures in Table 8 are in actual dollars with no inflation adjustment. The productivity gains enabled all carriers to have an average operating expense per mile in 2001 of \$1.93 in comparison to an average of \$1.99 in 1987. Thus, in actual dollars, the average expense per mile for the carriers taken together decreased between 1987 and 2001—a remarkable testament to the efficiency gains in the industry. The following industry segments experienced a decrease in average operating expenses per mile in actual dollars between 1987 and 2001: general freight, heavy machinery, less-than-truckload, and refrigerated carriers. The other segments experienced small increases in actual average operating expenses per mile.

Table 7: Annual Miles Per Truck Across Major Industry Segments, 2002 and 1987

Industry Segment	Calendar Year 2002	Calendar Year 1987
Building Materials	94,211	68,400
Bulk Commodities	83,338	76,500
General Freight	97,441	73,400
Less-than-Truckload	70,143	49,200
Household Goods	59,926	
Heavy Machinery	70,167	50,000
Motor Vehicles	79,129	61,400
Other Specialized Commodities	87,745	67,000
Refrigerated Commodities	111,455	90,900
Tank	82,078	64,100
All Carriers Combined	91,115	65,700

Source: 1987 data cited in Thomas M. Corsi and Joseph R. Stowers, "Effects of a Deregulated Environment on Motor Carriers: A Systematic, Multi-Segment Analysis," **Transportation Journal**, Vol. 30, No. 3, Spring 1991, p. 20. Data from 2001 based on Author's calculations from Motor Carrier Annual Report, 2001, American Trucking Associations, Alexandria, Virginia.

This table appears in Thomas M. Corsi, "The Truckload Carrier Industry Segment," **Trucking in the Age of Information**, Dale Belman, editor, Ashgate Publishing, forthcoming 2004.

Table 8: Operating Expenses Per Mile (in \$) Across Major Truckload Segments, 2001 vs. 1987

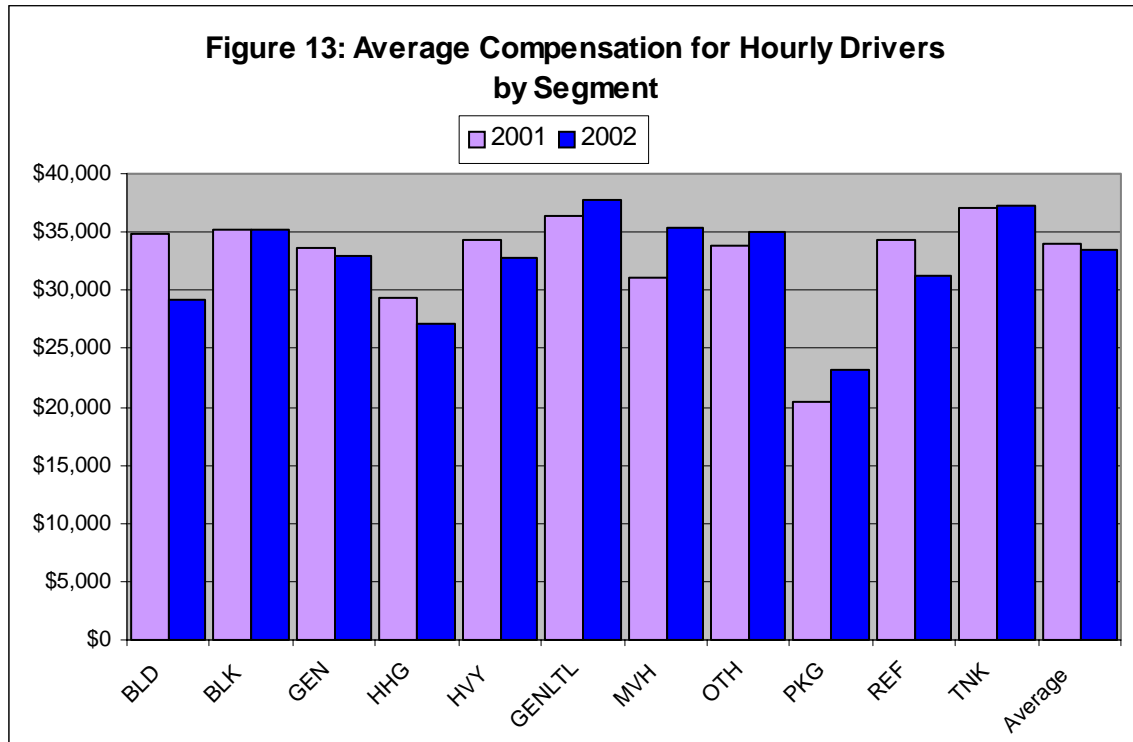
Industry Segment	Calendar Year 2001	Calendar Year 1987
Building Materials	1.72	1.50
Bulk Commodities	1.95	1.29
General Freight	1.67	1.80
Less-than-Truckload	2.91	3.01
Household Goods	3.83	
Heavy Machinery	2.50	2.52
Motor Vehicles	2.55	2.20
Other Specialized Commodities	2.02	1.73
Refrigerated Commodities	1.57	1.39
Tank	2.23	1.80
All Carriers Combined	1.93	1.99

Source: 1987 data cited in Thomas M. Corsi and Joseph R. Stowers, "Effects of a Deregulated Environment on Motor Carriers: A Systematic, Multi-Segment Analysis," **Transportation Journal**, Vol. 30, No. 3, Spring 1991, p. 13. Data from 2001 based on Author's calculations from Motor Carrier Annual Report, 2001, American Trucking Associations, Alexandria, Virginia. Data in Table 8 are actual dollars.

This table appears in Thomas M. Corsi, "The Truckload Carrier Industry Segment," **Trucking in the Age of Information**, Dale Belman, editor, Ashgate Publishing, forthcoming 2004.

Compensation Measures

Figures 13 through 15 address the issue of employee compensation among motor carriers taken together as well as in each of the individual industry segments. Figure 13 reports average annual compensation for drivers who are paid on an hourly basis. Figure 14 focuses on average annual compensation for drivers paid on a mileage basis. Figure 15 report average annual compensation for all employees.

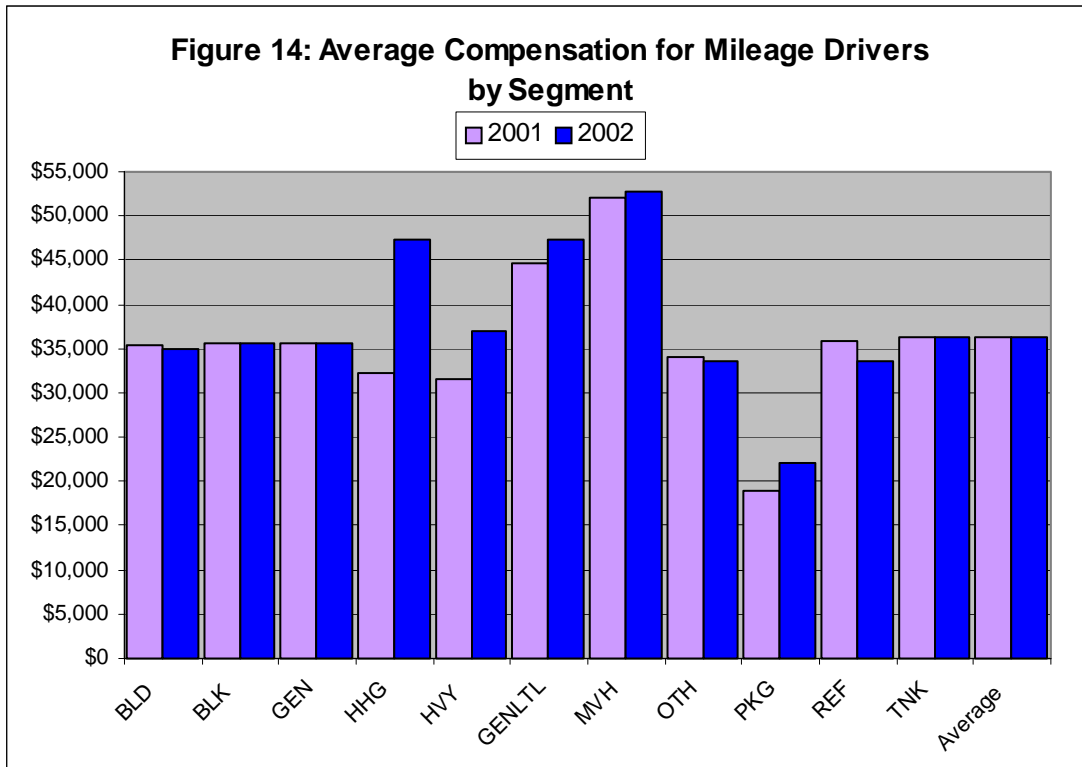


Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.

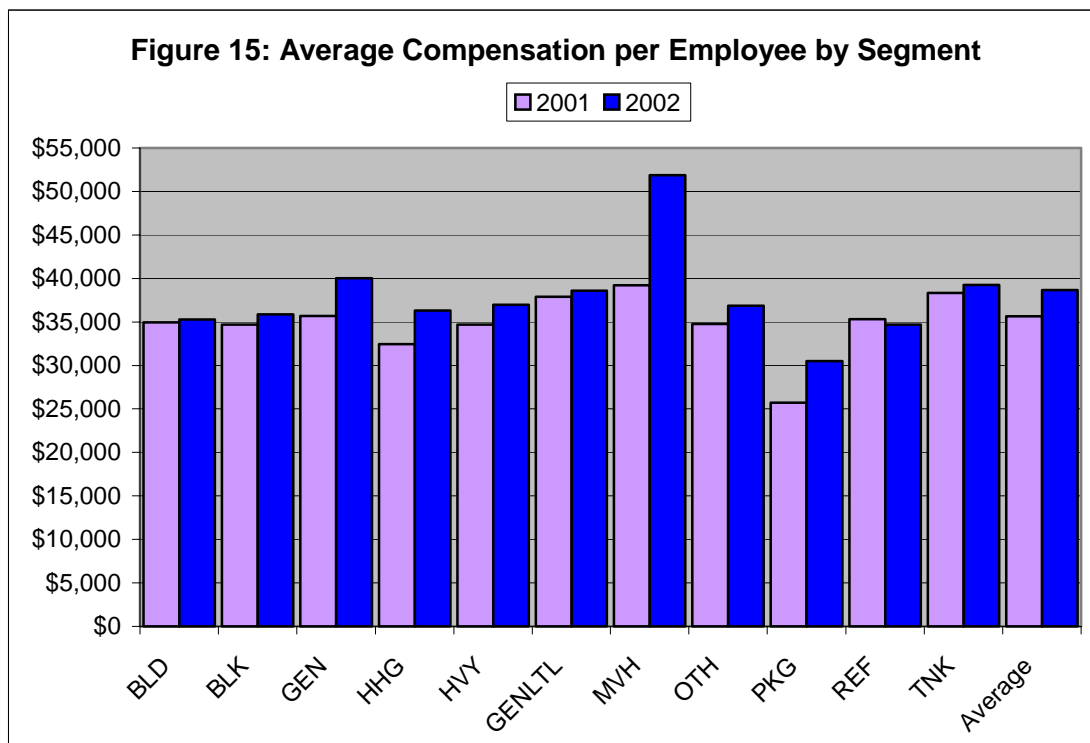
The general freight segment had the highest average compensation for drivers paid on an hourly basis, with an average 2002 compensation of \$37,793. The following four additional industry segments exceeded the average annual compensation for hourly drivers for all carriers: tank (\$37,186), motor vehicles (\$35,414), bulk (\$35,249), and other specialized carriers (\$35,024). Three segments—household goods, building materials, and package couriers—had average annual compensation for hourly drivers below \$30,000.

Figure 14 summarizes average annual compensation for drivers paid on a mileage basis for all carriers taken together as well as for carriers in each of the individual segments. Overall, the average annual compensation for drivers paid on a mileage basis in 2002 is \$36,362. Drivers in three industry segments made substantially more than those in other segments: motor vehicles (\$52,664), general freight (\$47,296), and household goods (\$47,289). Drivers in the package courier segment were paid substantially less at only \$22,163 for 2002.

Figure 15 presents information on the average annual compensation per employee for all carriers taken together as well as for carriers in each of the individual segments. The highest average compensation per employee in 2002 was in the motor vehicle segment (\$51,886) and was significantly greater than other segments.



Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.

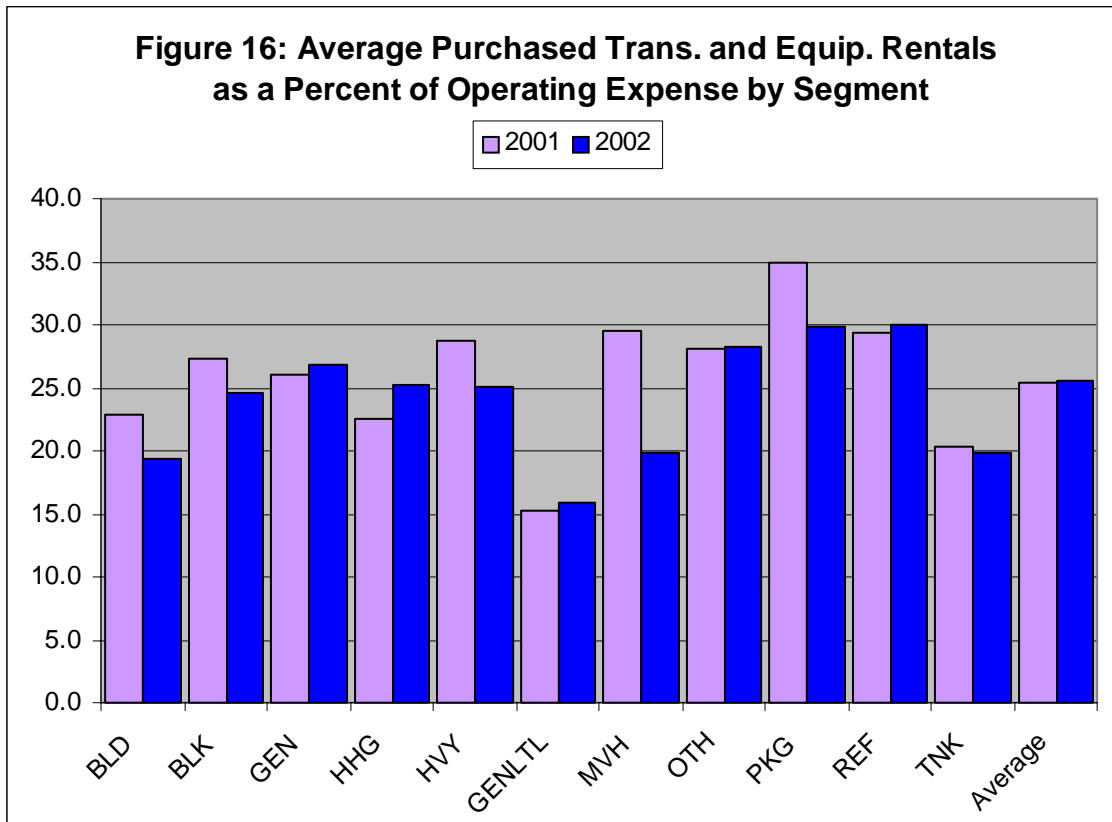


Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.

Leasing Measures

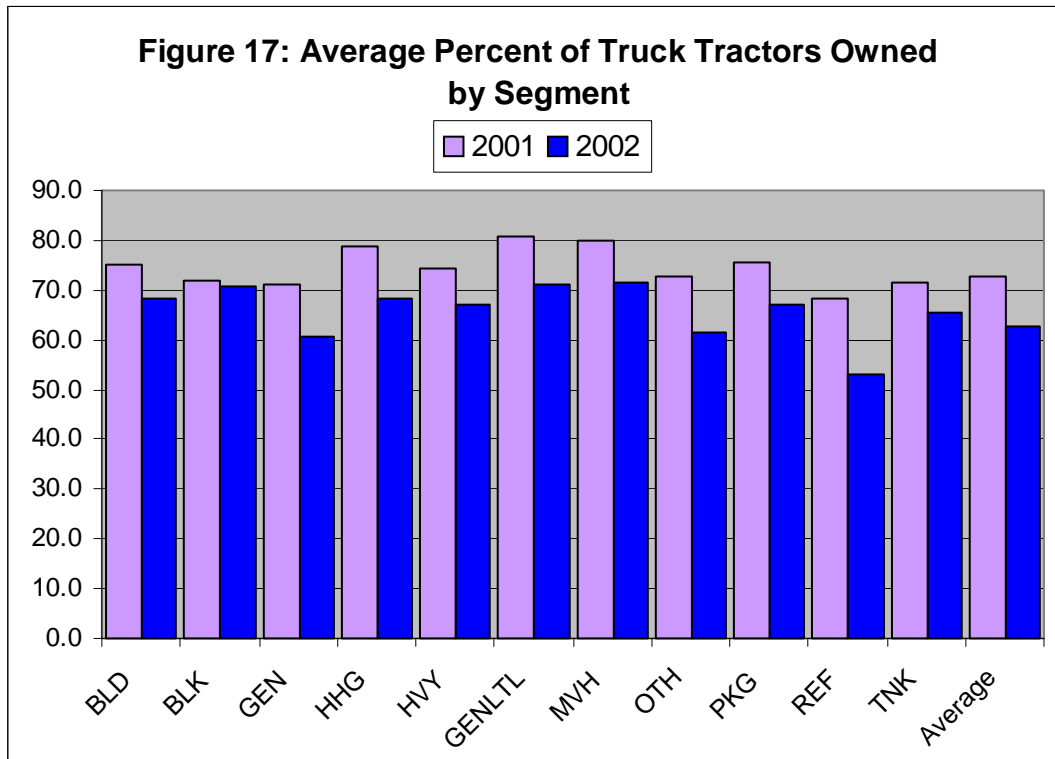
Figures 16 and 17 focus on the extent to which motor carriers overall and in each of the major industry segments rely on leased resources versus owned resources in conducting their operations. There is a significant debate about the impacts on performance of leasing versus owning assets within the motor carrier industry. Some firms prefer the leasing option because it gives them flexibility in being able to adjust capacity to meet market uncertainties. Owned assets provide the carrier with less flexibility in adjusting to common demand variations due to frequent business cycles. However, leased assets have disadvantages over owned assets in the sense that motor carriers can lose control over their leased assets. Indeed, leased owner-operator drivers present significant management challenges since they are, as their name implies, often independent and difficult to manage. Figure 16 shows the average purchased transportation and equipment rental expenses as a percent of a carrier's overall operating revenues for all carriers combined and for each of the industry segments. Figure 17 displays the mean percent of truck tractors that all carriers combined and those carriers in each of the segments own.

The average amount motor carriers spent on purchased transportation and equipment rentals equaled 25.6% of total operating expenses in 2002. Refrigerated carriers (30.0%) tended to use rental equipment most often and general freight carriers (15.8%) least often in 2002.



Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.

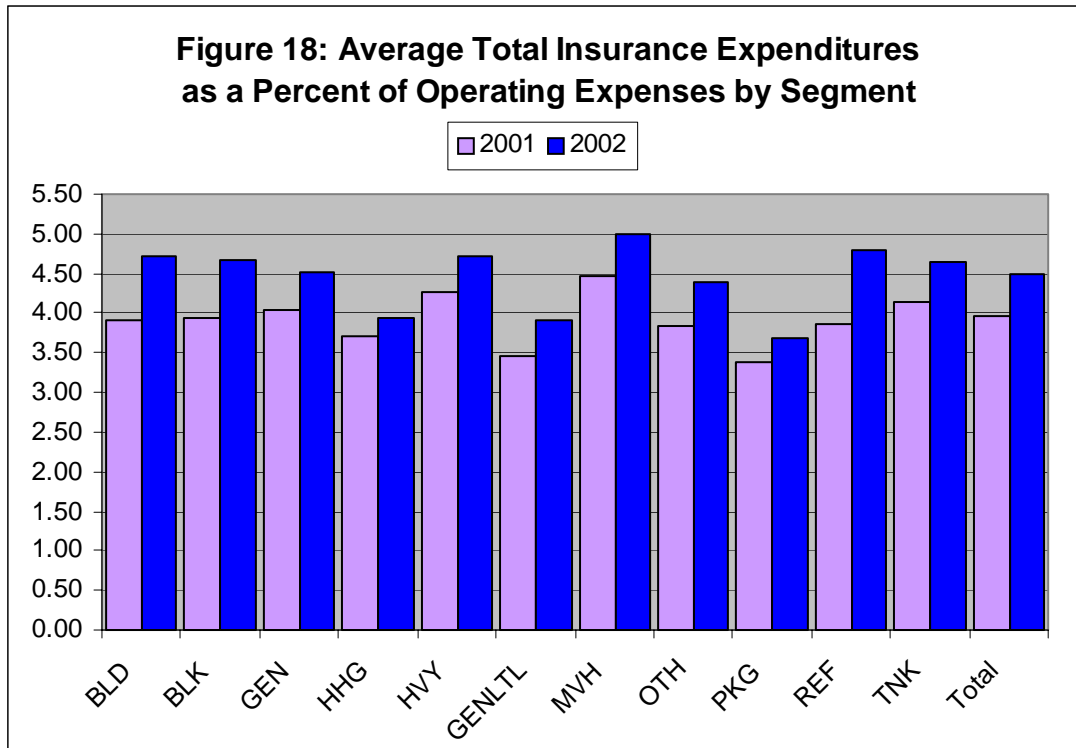
Figure 17 displays information on the average percent of truck tractors owned by all carriers combined and by carriers in each of the individual segments. Motor vehicle carriers had the highest percent of truck tractors owned in 2002, with a 71.7% ownership figure. The segments with the second highest and third highest tractor ownership percentages were general freight (71.0%) and bulk (71.0%). The individual segment with the lowest tractor ownership average was the refrigerated segment (53.1%). Overall, the average vehicle ownership percentage for 2002 is 62.6%.



Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.

Safety Expenditures

An important public policy question is the extent to which motor carriers overall and in each of the individual segments devote resources to safety-related activities. Unfortunately, the Annual Report data provide few direct measures of the safety level of effort made by the carriers. One proxy for the safety effort of motor carriers is the percent of a carrier's operating expenses devoted to insurance. While the initial indication is that carriers devoting a higher portion of their expenses to insurance might be making a greater safety effort, there is no way to separate out carriers whose high insurance burden is a consequence of a poor safety record. Regardless, data displayed in Figure 18 show that overall and across all individual segments carriers expend between 4% and 5% of their operating expenses on insurance. The segment in 2002 with the lowest percentage of operating expenses devoted to insurance is the package courier group (3.69%), and the segment with the highest percentage (5.00%) is the motor vehicle group.



Source: Author's calculations from Motor Carrier Annual Reports, 2001 and 2002, American Trucking Associations, Alexandria, Virginia. Author compiled results from CDs of Annual Report data for calendar years 2001 and 2002.

Conclusion

This report summarizes some key information about the motor carrier industry, with a specific focus on the Class I and II for-hire interstate motor carriers. The report presents strong evidence indicating that for-hire carriers have made significant productivity improvements during the past 15 years. These productivity improvements have enabled the for-hire motor carriers to deliver services at approximately the same cost as in 1987—in actual dollars, not even accounting for inflation.

While the expectation might be that an industry with high levels of productivity would be very profitable, this is clearly not the case in the motor carrier industry. With only a few exceptions in several of the segments, the profitability of motor carriers for the investment community is marginal at best. This marginal profitability in the face of high productivity levels is a testament to the intense competition present in the motor carrier industry. Most efficiency gains have been passed along to the major shipping customers, who have demanded delivery timeliness and low prices as they respond to the demands of just-in-time inventory systems and the pressures to reduce supply chain management costs.

In addition to discussing the productivity and profitability dynamics of the industry, this report focuses on analyzing compensation levels and the decision by firms in the industry to buy or lease equipment/drivers. The final section looks briefly at the safety expenditure effort by the

carriers; however, it is recognized that the measure of a firm's safety effort used in this study is an inadequate proxy variable. Clearly, some additional data collection effort would be required for an effective comparison of the safety effort by industry firms.

The motor carrier industry is dynamic and subject to many changes and shifting demands. It is clear that with bankruptcies continuing at a high rate, only carriers adept at shifting strategies will survive in the long run.

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