



Surface Transportation Board

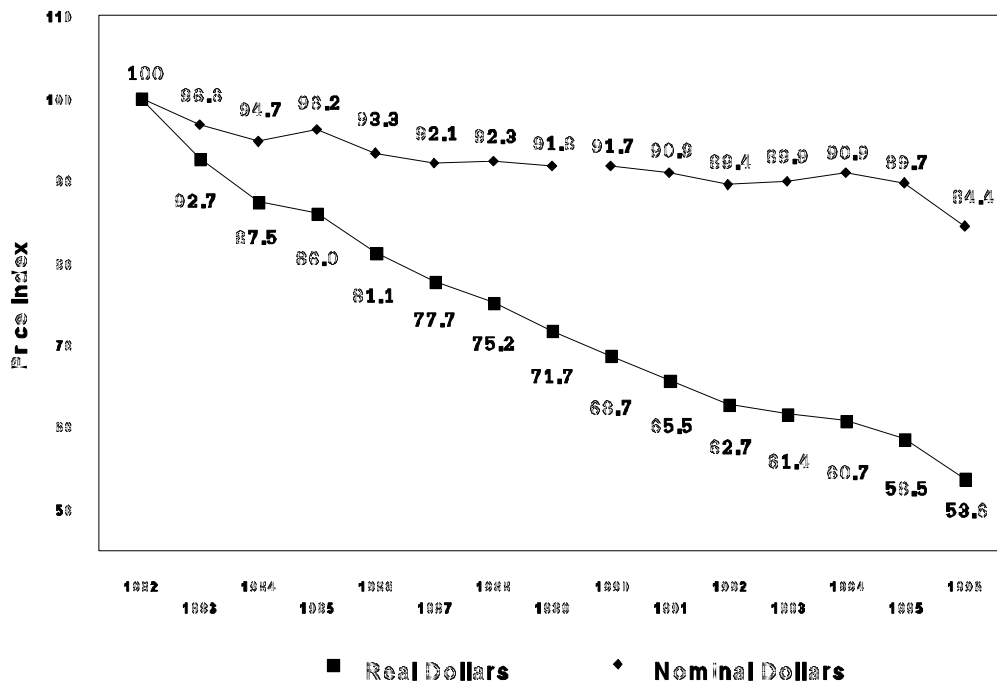
Office of Economics, Environmental Analysis,
and Administration

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RAIL RATES CONTINUE MULTI-YEAR DECLINE

The average, inflation-adjusted U.S. Class I railroad¹ rate has fallen substantially since 1982. As shown below, the average real rate has fallen 46.4 percent between 1982 — two years after the

Class I Railroads' Price Index



Staggers Act, the major regulatory reform legislation affecting railroads — and 1996. Although there have been small increases in the nominal rate in some years, there has been a continuous decline in the real rate since 1982 and the nominal rate has shown an overall decline of 15.6 percent.

¹ Class I railroads are those railroads with operating revenues of over \$250 million for three consecutive years.

"Rate" is defined as gross revenue per ton-mile of freight originated, and is converted to constant 1982 dollars using the Gross Domestic Product (GDP) Implicit Price Deflator. The average rate is calculated using a "Tornqvist" index. That is, annual rate changes for fifteen rail outputs are aggregated together by weighting each by its percentage share of total rail revenue. The revenue share weights change over time, reflecting the changing output mix during the period. The fifteen outputs are made up of fourteen major commodity groups, defined by two-digit Standard Transportation Commodity Code (STCC), and an "all other" category.

The data come from two sources. The annual railroad *Freight Commodity Statistics* (FCS) is used for revenues and tons by commodity group and the annual railroad Carload Waybill Sample is used to derive average length of haul by commodity group.² Ton-miles for each commodity group are derived by multiplying the FCS's tons by the average length of haul obtained from the waybill sample.³

The basic finding of a significantly reduced average rate does not depend on the details of the measurement approach. Comparable results are obtained from indices using less aggregated versions of these data as a starting point and also from indices that use other definitions of "rate," such as revenue

² A variant of this index has been computed and issued in the past by the Interstate Commerce Commission (ICC), and typically used 1978 as the starting date. The ICC index was based on rail revenue per ton, and thus only required data from the FCS. The change here to an index based on rail revenue per ton-mile requires length of haul data from the waybill sample. The decision to use 1882 as the starting date results from an assessment that length of haul statistics are not as reliable prior to that date.

³ There are certain limitations inherent in the data. In particular, the railroads are increasingly using an accounting rule which allows them to "rebill" certain traffic. "Rebilling" refers to interline movements that are split into two or more separate waybills. Each rebilled waybill record shows the shipment as two, or more, shorter-haul shipments. To the extent that the separate (rebilled) waybills are increasingly included in the waybill sample, this will tend to *understate* the average length of haul statistics derived from them which will understate total rail ton-miles, and *overstate* the average rail rate, and thus *understate* the drop in rates. This is especially true with regard to intermodal traffic.

In addition, there will be less rail revenues reported when services that were railroad-supplied are now shipper-supplied. As an example, there has been an increasing propensity for shippers to utilize privately-owned cars instead of railroad-owned cars. This causes a relative fall in railroad revenues which is not a true decrease in the cost of shipping via rail. Thus, an increase in the usage of private cars would cause an understatement of the true rail transportation rate and overstate the drop in rates over this time frame, as would the added expense incurred by some farmers of trucking their grain a bit further to larger elevators that pay more for grain because of reduced unit train rates.

Finally, the revenues reported in the Freight Commodity Statistics do not take into account any end-of-year adjustments, such as reductions or rebates given as incentives for exceeding minimum tonnage commitments.

The conclusion that the average real rate has declined substantially is also not sensitive to the choice of an inflation measure. As shown below, between 1982 and 1996 the average nominal growth rate in aggregate revenue per ton-mile (that is, *unadjusted* for inflation) has fallen by 1.21 percent per year (calculated assuming continuous change rather than periodic compounding). This rate is well below general measures of inflation during the same period, with the average annual increase over this period for the GDP index being 3.3 percent.

per originated car-mile or revenue per ton. Similar results are also obtained from other index number formulas such as fixed-weight indices. In addition, these indices also largely parallel those developed by the Association of American Railroads as “Freight Revenue per Ton-Mile,” in the AAR’s pamphlet *Railroad Facts - 1997 Edition*, page 31.

Total Reduction and Average Annual Rate of Change in the Rail (Tornqvist) Price Index: 1982 - 1996		
	Total Reduction	Average Annual Rate of Change
Real 1982 Dollars (Inflation Adjusted)	46.4%	-4.35% per year
Nominal Dollars (Unadjusted for Inflation)	15.6%	-1.21% per year

NOTE: annual rates calculated assuming continuous rates of change.

It should also be noted that this study only takes into account one aspect of the overall cost of shipping via rail. The drop in rates actually understates the decline in the true total cost of using railroads for those shippers that have benefitted from service improvements, such as reduced transit times and more reliable on-time performance.

The long-term drop in the real rate occurred over a period in which aggregate rail output increased, especially in the latter years. Dividing total real revenue by the Tornqvist output price index yields an implicit output quantity index of ton-miles. Aggregate output measured this way see-sawed between 1982 and 1991, but in the period after 1991 rose by almost 40 percent. The average annual output increase of 3.1 percent over the 1982-1996 period masks fluctuations in output, including marked drops of 8 percent in 1984-85 and 11 percent in 1990-91.

Tables containing the underlying data are attached.

Additional information on these data or related data and index numbers is available from the Office of Economics, Environmental Analysis, and Administration, Suite 500, Surface Transportation Board, 1925 K St., NW, Washington, DC 20423.

Revenue Per Ton-Mile (Nominal Dollars)

	STCC	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
FARM PRODUCTS	01	0.026	0.024	0.034	0.023	0.022	0.020	0.021	0.021	0.022	0.020	0.021	0.022	0.024	0.022	0.023
METALLIC ORES	10	0.042	0.039	0.051	0.044	0.039	0.031	0.035	0.037	0.038	0.032	0.031	0.037	0.038	0.035	0.033
COAL	11	0.024	0.024	0.025	0.023	0.023	0.024	0.024	0.024	0.024	0.024	0.024	0.023	0.023	0.020	0.017
NONMETALLIC MINERALS, EX FUELS	14	0.038	0.036	0.033	0.039	0.038	0.036	0.035	0.035	0.035	0.035	0.036	0.035	0.034	0.033	0.032
FOOD AND KINDRED PRODUCTS	20	0.043	0.039	0.034	0.038	0.035	0.034	0.034	0.034	0.033	0.032	0.032	0.032	0.033	0.032	0.031
LUMBER AND WOOD	24	0.053	0.049	0.029	0.046	0.044	0.046	0.046	0.044	0.043	0.039	0.039	0.040	0.039	0.041	0.040
PULP, PAPER AND ALLIED PRODUCTS	26	0.055	0.054	0.048	0.053	0.051	0.051	0.054	0.054	0.053	0.053	0.051	0.051	0.048	0.051	0.052
CHEMICALS	28	0.041	0.040	0.038	0.042	0.040	0.039	0.040	0.040	0.040	0.041	0.040	0.040	0.040	0.041	0.041
PETROLEUM AND COAL PRODUCTS	29	0.048	0.046	0.049	0.046	0.043	0.043	0.043	0.041	0.040	0.040	0.038	0.039	0.039	0.038	0.039
STONE, CLAY GLASS AND CONCRETE PRODS	32	0.043	0.041	0.036	0.043	0.041	0.038	0.037	0.038	0.039	0.038	0.040	0.041	0.041	0.042	0.043
PRIMARY METAL PRODUCTS	33	0.044	0.041	0.042	0.042	0.040	0.036	0.035	0.035	0.036	0.035	0.034	0.035	0.036	0.037	0.035
TRANSPORTATION EQUIPMENT	37	0.111	0.110	0.109	0.113	0.112	0.114	0.118	0.121	0.123	0.121	0.118	0.117	0.122	0.135	0.124
WASTE AND SCAP MATERIALS	40	0.050	0.049	0.047	0.049	0.046	0.043	0.046	0.045	0.042	0.040	0.037	0.037	0.038	0.040	0.039
INTERMODAL	46	0.041	0.041	0.041	0.046	0.043	0.041	0.038	0.035	0.034	0.033	0.033	0.033	0.035	0.037	0.033
ALL OTHER COMMODITIES	--	0.060	0.060	0.055	0.056	0.054	0.053	0.049	0.049	0.051	0.059	0.057	0.051	0.050	0.050	0.046

NOTE: STCC 46 is formally titled "Miscellaneous Mixed Shipments, except Forwarder or Shipper Associations." It is labeled here as "Intermodal" because that is the traffic predominately identified as STCC 46.

Revenue Per Ton-Mile (Real 1982 Dollars)

	STCC	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
FARM PRODUCTS	01	0.026	0.023	0.031	0.021	0.019	0.017	0.017	0.016	0.016	0.015	0.014	0.015	0.016	0.015	0.015
METALLIC ORES	10	0.042	0.037	0.047	0.039	0.034	0.026	0.028	0.029	0.029	0.023	0.022	0.026	0.025	0.023	0.021
COAL	11	0.024	0.023	0.023	0.020	0.020	0.021	0.020	0.019	0.018	0.018	0.017	0.016	0.015	0.013	0.011
NONMETALLIC MINERALS, EX FUELS	14	0.038	0.035	0.030	0.035	0.033	0.031	0.029	0.027	0.026	0.025	0.025	0.024	0.023	0.021	0.020
FOOD AND KINDRED PRODUCTS	20	0.043	0.038	0.031	0.034	0.031	0.028	0.028	0.026	0.025	0.023	0.022	0.022	0.022	0.021	0.020
LUMBER AND WOOD	24	0.053	0.047	0.027	0.041	0.038	0.039	0.038	0.034	0.032	0.028	0.028	0.027	0.026	0.027	0.025
PULP, PAPER AND ALLIED PRODUCTS	26	0.055	0.052	0.044	0.047	0.044	0.043	0.044	0.042	0.040	0.038	0.036	0.035	0.032	0.033	0.033
CHEMICALS	28	0.041	0.038	0.036	0.037	0.035	0.033	0.032	0.031	0.030	0.030	0.028	0.027	0.027	0.027	0.026
PETROLEUM AND COAL PRODUCTS	29	0.048	0.044	0.046	0.041	0.037	0.036	0.035	0.032	0.030	0.029	0.027	0.027	0.026	0.024	0.025
STONE, CLAY GLASS AND CONCRETE PRODS	32	0.043	0.039	0.033	0.038	0.036	0.032	0.030	0.029	0.029	0.028	0.028	0.028	0.027	0.027	0.028
PRIMARY METAL PRODUCTS	33	0.044	0.039	0.039	0.038	0.035	0.030	0.028	0.027	0.027	0.025	0.024	0.024	0.024	0.024	0.022
TRANSPORTATION EQUIPMENT	37	0.111	0.105	0.100	0.101	0.098	0.096	0.096	0.094	0.092	0.087	0.082	0.080	0.082	0.088	0.079
WASTE AND SCAP MATERIALS	40	0.050	0.047	0.043	0.043	0.040	0.036	0.038	0.035	0.032	0.029	0.026	0.025	0.025	0.026	0.025
INTERMODAL	46	0.041	0.039	0.038	0.041	0.037	0.034	0.031	0.027	0.025	0.024	0.023	0.023	0.023	0.024	0.021
ALL OTHER COMMODITIES	--	0.060	0.058	0.051	0.050	0.047	0.044	0.040	0.038	0.038	0.042	0.040	0.035	0.033	0.032	0.029

Commodity Shares of Total Revenue

	STCC	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
FARM PRODUCTS	01	8.7%	8.9%	8.5%	7.1%	7.4%	8.2%	8.6%	8.4%	8.2%	8.2%	8.5%	8.3%	7.4%	9.0%	8.2%
METALLIC ORES	10	1.5%	1.7%	1.6%	1.4%	1.4%	1.3%	1.4%	1.4%	1.4%	1.4%	1.4%	1.3%	1.2%	1.2%	1.1%
COAL	11	23.9%	22.4%	23.4%	23.5%	22.6%	22.2%	21.9%	22.5%	23.5%	25.6%	24.3%	21.3%	21.7%	21.9%	22.5%
NONMETALLIC MINERALS, EX FUELS	14	3.2%	3.1%	3.3%	3.3%	3.0%	3.0%	2.9%	2.9%	2.9%	2.7%	2.7%	2.7%	2.7%	2.6%	2.6%
FOOD AND KINDRED PRODUCTS	20	9.9%	8.8%	7.8%	8.0%	8.1%	7.8%	7.4%	7.3%	7.4%	7.6%	7.7%	7.7%	7.5%	7.3%	6.9%
LUMBER AND WOOD	24	4.9%	5.7%	5.4%	5.4%	5.7%	6.0%	5.5%	5.1%	4.7%	4.1%	4.3%	4.4%	4.4%	4.1%	4.1%
PULP, PAPER AND ALLIED PRODUCTS	26	6.5%	6.3%	5.8%	5.6%	5.7%	5.5%	5.2%	5.2%	5.0%	4.9%	4.9%	5.0%	4.7%	4.6%	4.3%
CHEMICALS	28	11.1%	11.5%	11.4%	11.9%	12.3%	12.6%	12.9%	13.0%	13.3%	13.3%	13.3%	14.1%	13.9%	13.7%	13.6%
PETROLEUM AND COAL PRODUCTS	29	3.4%	3.2%	3.1%	3.1%	3.0%	2.9%	3.1%	3.1%	3.1%	3.0%	3.1%	3.1%	3.0%	2.8%	3.0%
STONE, CLAY GLASS AND CONCRETE PRODS	32	3.4%	3.4%	3.4%	3.3%	3.3%	3.3%	3.3%	3.3%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.0%
PRIMARY METAL PRODUCTS	33	3.7%	3.1%	3.1%	3.0%	2.9%	3.1%	3.4%	3.3%	3.3%	3.1%	3.1%	3.4%	3.4%	3.7%	3.7%
TRANSPORTATION EQUIPMENT	37	7.4%	8.6%	9.7%	11.1%	11.0%	10.3%	10.9%	11.1%	10.4%	9.0%	9.3%	9.9%	10.0%	9.5%	9.9%
WASTE AND SCAP MATERIALS	40	1.6%	1.6%	1.6%	1.5%	1.6%	1.7%	1.8%	1.7%	1.7%	1.7%	1.8%	2.0%	2.0%	2.0%	2.0%
INTERMODAL	46	5.3%	6.6%	7.4%	7.4%	8.2%	8.4%	8.4%	8.5%	9.1%	8.6%	9.0%	10.2%	11.4%	11.0%	11.4%
ALL OTHER COMMODITIES	--	5.6%	5.1%	4.6%	4.4%	3.9%	3.6%	3.3%	3.3%	3.2%	3.7%	3.5%	3.6%	3.6%	3.6%	3.8%

Average Length of Haul (Miles)

	STCC	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
FARM PRODUCTS	01	657	690	485	669	682	700	719	755	754	764	769	765	750	877	846
METALLIC ORES	10	154	169	172	195	209	247	229	229	228	262	275	253	249	260	272
COAL	11	497	501	487	533	510	476	491	488	496	503	507	517	531	578	647
NONMETALLIC MINERALS, EX FUELS	14	265	237	295	234	227	226	232	237	242	238	237	241	238	242	250
FOOD AND KINDRED PRODUCTS	20	787	797	939	807	792	787	801	800	821	812	819	823	846	838	889
LUMBER AND WOOD	24	375	431	779	522	542	535	562	596	610	654	667	673	665	658	719
PULP, PAPER AND ALLIED PRODUCTS	26	853	847	951	836	846	828	827	840	848	843	850	868	863	849	850
CHEMICALS	28	790	779	811	753	778	763	771	776	786	783	797	808	797	799	814
PETROLEUM AND COAL PRODUCTS	29	587	543	536	572	566	540	538	576	577	585	591	572	586	608	613
STONE, CLAY GLASS AND CONCRETE PRODS	32	543	534	636	512	518	532	565	559	553	580	565	574	582	583	569
PRIMARY METAL PRODUCTS	33	693	626	697	656	660	719	772	780	716	721	719	687	667	713	723
TRANSPORTATION EQUIPMENT	37	944	942	1,005	1,007	1,018	1,046	1,097	1,104	1,093	960	915	901	899	860	933
WASTE AND SCAP MATERIALS	40	365	357	376	363	367	392	376	391	422	458	475	481	470	468	474
INTERMODAL	46	1,247	1,286	1,377	1,216	1,196	1,209	1,271	1,337	1,400	1,415	1,406	1,376	1,354	1,355	1,467
ALL OTHER COMMODITIES	--	1,163	1,113	1,232	1,112	1,022	1,004	1,047	1,108	1,057	1,111	1,120	1,091	1,087	1,154	1,271

Rail (Tornqvist) Price Index - Total U.S.

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Constant Dollars	100	92.7	87.5	86.0	81.1	77.7	75.2	71.7	68.7	65.5	62.7	61.4	60.7	58.5	53.6
Current Dollars	100	96.6	94.7	96.2	93.3	92.1	92.3	91.8	91.7	90.9	89.4	89.9	90.9	89.7	84.4

Percent Change in Revenue per Ton-Mile: 1982 - 1996

	STCC	Nominal	Real (Inflation Adjusted)
FARM PRODUCTS	01	-10.8%	-43.3%
METALLIC ORES	10	-19.9%	-49.1%
COAL	11	-30.3%	-55.7%
NONMETALLIC MINERALS, EX FUELS	14	-16.1%	-46.7%
FOOD AND KINDRED PRODUCTS	20	-28.4%	-54.5%
LUMBER AND WOOD	24	-24.5%	-52.0%
PULP, PAPER AND ALLIED PRODUCTS	26	-5.1%	-39.7%
CHEMICALS	28	1.1%	-35.7%
PETROLEUM AND COAL PRODUCTS	29	-17.7%	-47.7%
STONE, CLAY GLASS AND CONCRETE PRODS	32	1.3%	-35.6%
PRIMARY METAL PRODUCTS	33	-19.7%	-49.0%
TRANSPORTATION EQUIPMENT	37	12.4%	-28.6%
WASTE AND SCAP MATERIALS	40	-21.8%	-50.3%
INTERMODAL	46	-18.3%	-48.1%
ALL OTHER COMMODITIES	--	-24.1%	-51.7%