

SERVICE DATE – SEPTEMBER 29, 2017

SURFACE TRANSPORTATION BOARD

DECISION

Docket No. EP 290 (Sub-No. 4)

RAILROAD COST RECOVERY PROCEDURES—PRODUCTIVITY ADJUSTMENT

Digest:¹ The Board proposes a second tentative productivity adjustment for the change in the railroad productivity for the 2011-2015 averaging period, modified to reflect new data, and invites comments on a new “linking factor” computed to enable the modified 2015 productivity adjustment to be compared to prior years’ productivity adjustments.

Decided: September 29, 2017

Each year the Board calculates the change, if any, in the rail industry’s productivity, i.e., how efficiently railroads move freight. This figure, which is calculated by comparing, year-to-year, the average cost of producing a unit of railroad output, is used to adjust the rail cost adjustment factor (RCAF)² to reflect long-run changes in railroad productivity. See 49 U.S.C. § 10708(a)-(b); see also R.R. Cost Recovery Procedures—Productivity Adjustment, 5 I.C.C.2d 434, 434 (1989). This long-run measure of productivity is computed using a five-year moving geometric average. Productivity Adjustment—Implementation, 9 I.C.C.2d 1072, 1078 (1993).

On February 14, 2017, the Board tentatively adopted 1.020 (2.0% per year) as the measure of average (geometric mean) change in railroad productivity for the 2011-2015 (five-year) period. R.R. Cost Recovery Procedures—Productivity Adjustment, EP 290 (Sub-No. 4), slip op. at 1 (STB served Feb. 14, 2017), corrected (February Decision), EP 290 (Sub-No. 4) (STB served Feb. 24, 2017).³ Although the annual productivity calculation is typically routine and non-controversial, the Board explained in the February Decision that its adoption of 1.020 as the 2015 productivity adjustment was tentative due to a change in the method used to measure distances for rail movements in the Board’s annual Waybill Sample. Id. at 2-3. The Board further explained that the Federal Railroad Administration (FRA), with the Board acting in an

¹ The digest constitutes no part of the decision of the Board but has been prepared for the convenience of the reader. It may not be cited to or relied upon as precedent. Policy Statement on Plain Language Digests in Decisions, EP 696 (STB served Sept. 2, 2010).

² The RCAF is an index of railroad input prices that is published by the Board on a quarterly basis. See, e.g., Quarterly Rail Cost Adjustment Factor, EP 290 (Sub-No. 5) (2016-1) (STB served Dec. 18, 2015).

³ Citations to the February Decision refer to the February 24, 2017 corrected decision.

advisory capacity, awarded a contract in 2015 to Railinc Corporation (Railinc), under which Railinc would measure rail movement distances using a new methodology that relied on actual location data derived from electronic signals emitted as railcars pass a signal receptor. Id. at 2. The Board explained that, as a result of the new methodology, the distances should prove to be more precise than the distances determined under the prior methodology, which relied on an algorithm to predict the most likely route of a rail movement. Id.

In the February Decision, the Board compared the distances derived from the new approach versus the prior approach and found that the distances that resulted from actual location data appeared to be generally shorter than the calculated mileages assigned in previous years. Id. Because movement distances in the Waybill Sample are used to compute the yearly change in revenue ton-miles, which then becomes an input in the productivity adjustment, the Board proposed a productivity adjustment “linking factor” to account for the difference in the distance methodologies in 2011-2014 and 2015, and to avoid unfairly skewing the 2015 productivity adjustment. Id. The Board sought comment on the proposed linking factor, indicated that it would take further action to modify the tentative adjustment if appropriate, and held a technical conference on February 28, 2017. Id. at 3.

On March 16, 2017, shortly after the technical conference, Railinc, the government’s contractor, asked the Board to suspend the comment deadline so that Railinc could complete a review of the 2015 Waybill Sample and the changes in mileages discussed in the February Decision. The Board suspended the deadline for comments pending further order. R.R. Cost Recovery Procedures—Productivity Adjustment, EP 290 (Sub-No. 4) (STB served Mar. 16, 2017).⁴ The Board subsequently advised stakeholders, interested parties, and the public that it would not be able to produce a number of work products that rely on the Waybill Sample mileage calculations until issues related to the new methodology were resolved. See, e.g., R.R. Cost Recovery Procedures—Productivity Adjustment, EP 290 (Sub-No. 4), slip op. at 1 (STB served Apr. 11, 2017).

The Board’s adoption of the tentative productivity adjustment figure in the February Decision was based on the Board’s understanding that the new methodology for measuring distances, using actual location data, had been implemented and was reflected in the processed 2015 Waybill Sample data Railinc provided to the Board. The Board subsequently learned from Railinc, however, that the 2015 Waybill Sample data referenced in the February Decision did not in fact reflect actual location data derived from the electronic signals.

Once the Board was made aware of the Waybill Sample data discrepancy, Board staff worked closely with both FRA and Railinc toward a revised 2015 Waybill Sample implementing the new methodology. The Board has now received the corrected data from Railinc. The 2015 Public Use Waybill Sample, reflecting the new method for calculating distances, is available on the Board’s website. Railinc’s 2015 Carload Waybill Sample Reference Guide, which contains a

⁴ One party filed a comment on the same day. (See Western Coal Traffic League Comment, Mar. 16, 2017).

description of the new methodology for calculating distances, is also available on the Board's website.⁵

Upon receiving the corrected 2015 Waybill Sample that used actual location data in developing distances, the Board once again compared the distances in the 2015 Waybill Sample to the distances reported in the 2014 Waybill Sample. In contrast to the comparison made in February, which involved Waybill Sample data that did not incorporate actual location data, the Board determined that when actual location data is reflected in the Waybill Sample, there is variability in the distances for each origin-destination pair. On average, the mileages derived from the new approach are generally longer than the calculated mileages assigned in prior years. A difference in distances that derives purely from methodological changes, regardless of the direction of the change, would unfairly skew the productivity adjustment because distances directly affect revenue ton-miles, an input in the productivity adjustment calculation. Accordingly, for the reasons explained in the February Decision, EP 290 (Sub-No. 4), slip op. at 2, the Board proposes a linking factor to account for this general change in distances.⁶

The linking factor methodology proposed in this decision differs from that in the February Decision as a result of variability in the mileage data in the 2015 Waybill Sample. The linking factor in the February Decision depended on being able to match movements between the 2014 and 2015 Waybill Samples with a high degree of confidence. However, the variability in mileages between origin-destination pairs in the 2015 Waybill Sample, which naturally flows from using actual location data, makes employing a matching approach more complex because, unlike the 2014 data, in the 2015 data there is not always a single mileage value for each origin-destination pair.⁷ The Board therefore developed an approach that would not require route matching.

As the Board explained in the February Decision, the relevant input for the Board's productivity calculation is revenue ton-miles. The linking factor should prevent changes in the miling methodology, rather than underlying changes in productivity, from inflating or deflating aggregate revenue ton-miles. While the February Decision focused on identifying the extent to which miles changed between 2014 and 2015, it is also possible to estimate directly how the change in miling methodology affected revenue ton-miles between 2014 and 2015. The Board

⁵ The 2015 Public Use Waybill Sample and Railinc's Carload Waybill Sample Reference Guide can be found at www.stb.gov. To access, use the drop-down menu "Industry Data," click on "Economic Data," follow hyperlink "Waybill," scroll down page and select either the link "2015 Public Use Waybill Sample" or the link "Reference Guide."

⁶ As the underlying data from which the linking factor is calculated have changed, the linking factor value calculated in the February Decision cannot be used.

⁷ Under the miling approach used through 2014, the route—and therefore the mileage—for a given commodity and origin-destination pair was assumed to be the same for every movement. Under the new miling approach, actual data of the route taken for individual movements is used. Thus, the 2015 data shows that the route/mileage is not always the same for each movement of a commodity for an origin-destination pair.

proposes a statistical technique, a simple linear regression, to estimate the ton-mile figure that would have been produced for 2015 under the miling methodology used in 2014 and earlier years. This figure could then be compared to the ton-miles reported in the corrected 2015 Waybill Sample to develop a linking factor that adjusts for the change in methodology. To produce the estimate of what the ton-miles likely would have been using the prior methodology, the Board calculated an ordinary least squares regression equation with aggregate ton-miles used in the Board's productivity calculation, which are based on the ton-miles reported in railroad R-1s, for each year from 1990-2014 as the independent variable and aggregate ton-miles reported in the Waybill Sample for the same years as the dependent variable.⁸ The simple regression estimate indicates that the new miling methodology results in ton-miles that, on average, are 4.4% higher than those that would have been developed using the prior miling methodology.⁹ The linking factor associated with a 4.4% increase in ton-miles is 0.9579.¹⁰ The linking factor is applied to the output index for 2015.

With the linking factor adjustment, the Board's calculation of the productivity change for the year 2015 is 0.939, based on changes in input and output levels from 2014, which represents a decrease of 7.8% from the rate of productivity growth in 2014 relative to 2013 (1.018). Incorporating the 2015 value with the values for the 2011-2014 period produces a geometric average productivity growth of 0.994 for the five-year period 2011-2015, or -0.6% per year. As the new geometric mean was computed by removing the 2010 figure of 1.037 and adding the smaller figure of 0.939 for 2015, there was a decrease of 2.0% in the geometric mean from last year's value. A discussion of how the Board calculates productivity is contained in the Appendix to this decision.

⁸ Typically, aggregate ton-miles reported by the railroads in their R-1 filings and ton-miles calculated from the Waybill Sample for the same year are not identical, but instead differ by several percent. For example, there were 4.3% more R-1 ton-miles than Waybill ton-miles in 2014, and 4.1% more in 2013.

⁹ The 4.4% figure is determined by dividing the reported 2015 Waybill Sample ton-miles (1.764174 trillion) by the estimated 2015 ton-miles from the regression (1.689833 trillion) and subtracting 1. The regression equation yields: Prior Method Ton-Miles = -53,053,458 + 1.002647082345260 x 1.7382846 trillion (the 2015 R-1 ton-miles). The regression displays a good statistical fit, with an R² value of 0.987854721. Data inputs used in the regression analysis are included in Table C in the Appendix, and the regression outputs are reported in Table D.

¹⁰ The linking factor is $1/(1 + x)$, where "x" is the 4.4% change in ton-miles caused by the change in methodology. The linking factor value of 0.9579 is less than 1, as expected, because the linking factor needs to reduce aggregate revenue ton-miles to account for the increase in revenue ton-miles under the new methodology. Because productivity is calculated by looking at the change from one year to the next, the linking factor used here would be needed only for the 2015 productivity adjustment. Starting with the 2016 productivity adjustment, the Board will be comparing two years of revenue ton-mile figures that both will be based on the new approach for calculating distance.

Because of the unique circumstances of this year's productivity adjustment calculation, the Board will continue to designate the revised productivity adjustment as tentative to allow public comment on the linking factor. In submitting comments, the Board especially encourages input on any potential data or computational errors. Any party proposing a different estimate of productivity growth based on data or computational errors must, at the time it files a comment, furnish the Board with one set of detailed workpapers and documentation underlying its calculations. The same information must be made available to other parties upon request.

The Board will hold a technical workshop regarding the proposed linking factor and the reasons for proposing such a factor. The purpose of the technical workshop is for Board staff to explain the proposed linking factor to interested persons and to answer technical questions about the linking factor methodology. Prior to the workshop, interested persons may submit technical questions on the linking factor proposal. Submitted questions should avoid referring to confidential information and should be framed in a way that would not require the disclosure of confidential information when answered. Questions should be submitted to Economic.Data@stb.gov by October 11, 2017. Board staff may also answer follow-up questions during the technical workshop as time permits.

The technical workshop will take place on October 17, 2017, at 10:00 AM in the Board's Hearing Room at 395 E Street, SW, Washington, DC 20423-0001. This workshop will be available on the Board's website by live video streaming. To access the workshop, click on the "Live Video" link under "Information Center" at the left side of the home page beginning at 10:00 AM on October 17, 2017.

The tentative productivity adjustment proposed in this decision will not become effective until the Board has had the opportunity to consider comments submitted by parties. Once comments have been reviewed, the Board will take further action, as appropriate, to adopt and implement a final productivity adjustment.

It is ordered:

1. Comments are due by November 13, 2017; replies are due by December 13, 2017.
2. An original and 10 copies must be filed with:

Surface Transportation Board
395 E Street, S.W.
Washington, DC 20423-0001

3. Comments and replies must be served on all parties appearing on the current service list.
4. A technical workshop in this proceeding is scheduled for October 17, 2017, at 10:00 A.M., as discussed above. Interested persons are invited to attend.

5. Interested persons are directed to submit any questions they may have to Economic.Data@stb.gov by October 11, 2017, as discussed above.

6. Notice of this decision will be published in the Federal Register.

7. This decision is effective on its service date.

By the Board, Board Members Begeman, Elliott, and Miller.

APPENDIX

The following is a description of the methodology currently used to calculate the RCAF productivity adjustment.¹¹ The annual rate of productivity change is calculated by dividing an output index by an input index.

The input index uses constant dollar-adjusted expenses. The inputs in this index—freight expenses, fixed charges, and contingent interest—are stated on a constant dollar basis using the most recent year available as the base, and updating the base by the Series Rail Cost Recovery (RCR) Index published by the Association of American Railroads. Freight expenses, fixed charges, and contingent interest were obtained from railroad Annual Report (Form R-1) data. The 2015 Total Expense Constant Dollars for each of the six years was calculated by dividing a given year's RCR index value into the RCR index values for 2015 (493.3) and then multiplying that ratio by the Total Expense Unadjusted. The calculation of the input indices and values used are shown in Table A.

The 2015 output index was developed from the costed Waybill Sample, a commonly used data source. Prior to the application of the linking factor, the output index was 0.953. After multiplying the output index by the linking factor of 0.9579, the adjusted output index becomes 0.913. The costed Waybill Sample excludes movements lacking sufficient information for the application of unit costs.

Using the costed Waybill Sample as a base, each movement is assigned to one of the 189 segments or categories used to develop the output index. Segmentation is based on three mileage blocks, seven car types, three weight brackets, and three shipment sizes. The output index is a composite of the year-to-year change in ton-miles for each of the 189 segments weighted by each segment's base-year share of total revenues.

The change in productivity is calculated by dividing the output index by the input index. The multi-year average for the period 2011-2015 is calculated by taking a geometric mean, which was found to be 0.994 (-0.6% per year). The input index, the output index, the annual productivity change, and the calculation of the 2011-2015 average are shown in Table B.

¹¹ The development and application of the productivity adjustment is explained in Railroad Cost Recovery Procedures—Productivity Adjustment, 5 I.C.C.2d 434 (1989).

Table A
Calculation of Input Indices
2010-2015

Year	Total Expense Unadjusted (000s) (1)	RCR Indices 2010-2015 (2)	Total Expense Constant Dollars (3)	Input Index Column (3) 2011/2010 etc. (4)
2010	43,763,629	465.1	46,417,111	
2011	50,243,494	513.7	48,248,230	1.039
2012	51,464,512	526.8	48,191,807	0.999
2013	52,366,102	526.3	49,082,649	1.018
2014	54,753,917	531.0	50,866,492	1.036
2015	49,465,744	493.3	49,465,744	0.972

Table B
Comparison of Output, Input, and Productivity
2011-2015

Year	Output Index (1)	Input Index (2)	Productivity Change ⁴ Col (1)/Col (2) (3)
2011	1.041	1.039	1.001
2012	1.007	0.999	1.008
2013	1.022	1.018	1.003
2014	1.055	1.036	1.018
2015	0.913	0.972	0.939
Productivity Change Five-Year Moving Avg.			0.994

The five-year (2011-2015) productivity trend calculated using a geometric average is 0.994, or -0.6%. Note that there are changes in some of the individual numbers in Table A and

Table B compared with corresponding years in an earlier decision. R.R. Cost Recovery Procedures—Productivity Adjustment, EP 290 (Sub-No. 4) (STB served Mar. 4, 2014). These changes represent the revisions to the R-1 submitted by the railroads which were first incorporated into our 2008-2012 productivity study. None of the changes are large enough to affect the five-year moving geometric average calculated in previous decisions.

Table C
Regression Inputs

Year	Waybill Total Ton-Miles (in Thousands)	R-1 Total Ton-Miles (in Thousands)
1990	1,008,487,100	1,033,968,480
1991	986,735,706	1,038,877,790
1992	1,032,848,800	1,066,783,930
1993	1,064,688,940	1,109,305,720
1994	1,135,041,310	1,200,701,700
1995	1,228,041,090	1,305,686,570
1996	1,298,550,620	1,365,078,970
1997	1,297,929,730	1,359,022,920
1998	1,354,455,320	1,388,311,220
1999	1,375,470,750	1,452,073,030
2000	1,410,854,030	1,487,697,350
2001	1,445,140,890	1,495,473,980
2002	1,439,538,220	1,507,010,410
2003	1,493,152,960	1,551,436,480
2004	1,618,972,380	1,662,597,460
2005	1,661,325,670	1,696,426,230
2006	1,790,539,330	1,771,901,680
2007	1,759,778,310	1,770,546,270
2008	1,680,156,920	1,777,235,000
2009	1,546,970,730	1,532,215,690
2010	1,665,609,500	1,691,002,860
2011	1,683,452,590	1,729,257,010
2012	1,645,078,770	1,712,567,750
2013	1,672,522,370	1,740,684,920
2014	1,774,143,800	1,851,230,390

Table D
Regression Outputs

Regression Statistics					
Multiple R	0.993908809				
R-Square	0.987854721				
Adjusted R-Square	0.987326665				
Standard Error	28926804.65				
Observations	25				
ANOVA					
	Df	SS	MS	F	Significance F
Regression	1	1.56536E+18	1.56536E+18	1870.739958	1.55E-23
Residual	23	1.92455E+16	8.3676E+14		
Total	24	1.58461E+18			
	Coefficients	Standard Error	T Stat	P-Value	
Intercept	-53053458.1	35064651.183	-1.513018277	0.143895834	
X-Variable	1.002647082	0.023181492	43.25205149	1.55E-23	