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CHAPTER 12

STREET AND ELECTRIC RAILWAYS

§ 12a. Census Data Available

The task of estimating the value product of the street and electric railways of the country is made relatively easy by the existence of three Censuses taken in 1907, 1912, and 1917 respectively. These Censuses seem very complete and give most of the information in the form necessary for this study.

§ 12b. Share of Security Holders and Other Property Owners

In the *Census of Electric Railways*, the term "gross income" means the amount remaining from the entire income after operating expenses and taxes have been paid. Since it is evident that practically all the value product of this industry must arise from the activities of *operating* companies only, the gross income of this class of companies is taken as a starting point. From this sum, however, must be deducted a number of items before arriving at the amounts available for disbursement to security holders or as payment for leased property. These items may be enumerated as follows:—

1. Income received as dividends or interest on the bonds of other corporations. Such amounts must be deducted because, under the plan of procedure determined upon, they are counted in the value product of the industry in which the paying corporation is engaged.

2. Taxes and expenses of lessor street railway companies. These amounts are deducted because they do not go to investors in street railways.

3. Interest on unfunded debt. This is presumably paid mostly to banks and will be considered in their income when dealing with that field.

4. Miscellaneous debits. Items under this head are stated by the Census to consist mainly of taxes on securities, losses incurred, etc. These items evidently are deductions from the amounts going to investors in the street railway field.

Table 12A shows the net results of these calculations for the Census years.

TABLE 12A

THE SHARE OF SECURITY AND PROPERTY OWNERS IN THE NET VALUE PRODUCT OF THE STREET AND ELECTRIC RAILWAYS OF THE CONTINENTAL UNITED STATES IN THE CENSUS YEARS

(Values in Thousands of Dollars)

Year	Gross income as reported by Census [b]	Deductions [a]	Available for bond interest, dividends, rents and surplus
1907.....	$158,679	$26,541 [c]	$132,138
1912.....	218,006	29,121 [f][d]	188,885
1917.....	231,757	26,598 [e]	205,159

[a] See text for description.
[b] *U. S. Census of Street and Electric Railways* for 1917, pp. 13–14.
[c] *U. S. Census of Street and Electric Railways* for 1907, pp. 123–125; 142.
[d] *U. S. Census of Street and Electric Railways* for 1912, pp. 236; 245; 250.
[e] *U. S. Census of Street and Electric Railways* for 1917, pp. 14; 78; 83.
[f] The interest on the unfunded debt was estimated at 9.9% of all interest, this being an average of the percentages for 1907 and 1917. The estimated amount for 1912 was 9,710 thousands of dollars.

The interpolation of the share of entrepreneurs and other property owners for the intercensal years is shown in Table 12B. It is based upon the assumption that changes in the net share are proportionate to changes in the net operating revenue of the companies. Since the two quantities are so nearly identical, the error from this assumption is certain to be slight.

The figures for net operating revenue for intercensal years since 1913 are taken from the estimates made by the Deputy Public Service Commissioner of New York. These estimates are said to have been made after extensive investigation. For the years 1909 to 1913 inclusive, he presents no information; hence use has been made of a compilation of the data shown in the annual reports of a number of the leading street railways of the United States.

It is believed that the final estimates derived in the manner just stated are close to the truth and are sufficiently accurate for all practical purposes. The figures appear in Table 12B.

TABLE 12B

THE ESTIMATED AGGREGATE OF THE INTEREST, RENT, DIVIDENDS, AND SAVINGS OF THE STREET AND ELECTRIC RAILWAYS OF THE CONTINENTAL UNITED STATES

(Values in Thousands of Dollars)

A	B	C	D	E	F	G	H
Year	Net operating revenue of all companies; census figures [a]	Interest, dividends, and surplus of 28 typical companies [b]	Ratio of B to C	Estimated net operating revenue B × D	Sum of interest dividends rent and surplus; Census years [f]	Ratio of F to E	Estimated sum of interest dividends rent and surplus E × G
1907....	$166,879	$45,855	3.639 [c]	$166,879 [a]	$132,138	.792 [c]	$132,138 [f]
1909....		52,189	3.715 [d]	193,900		.799 [g]	154,800
1910....		55,310	3.748 [d]	207,300		.801 [g]	166,100
1911....		58,150	3.785 [d]	220,100		.804 [g]	177,000
1912....	234,615	61,430	3.819 [c]	234,615 [a]	188,885	.805 [c]	188,885 [f]
1913....				239,138 [e]		.805 [g]	192,400
1914....				243,661 [e]		.804 [g]	195,900
1915....				248,185 [e]		.802 [g]	199,100
1916....				252,707 [e]		.800 [g]	202,100
1917....	257,230			257,230 [a]	205,159	.798 [c]	205,159 [f]
1918....				155,669 [e]		.794 [g]	123,600

[a] *U. S. Census of Street and Electric Railways*, for 1917, pp. 13–14.
[b] Computed from data appearing in Poor's and Moody's *Manual of Statistics*.
[c] Computed.
[d] Interpolated along a straight line.
[e] Estimated by Alfred M. Barrett, Public Service Commissioner of New York. See *Annalist*, Jan. 5, 1920, p. 22.
[f] See Table 12A.
[g] Read from a smooth curve.

§ 12c. Share of the Employees

The Census reports separately wages and salaries for the different Census years, but it is stated that the distinctions between the two have perhaps changed somewhat and hence are of little value. For this reason, both are here combined. Since data for the intercensal years 1909, 1910, and 1911 are unavailable, estimates for those years have been made on the assumption that wages have varied along a smooth curve. In an industry as stable as that of street railways, and in a period characterized by no radical changes, this method should be fairly accurate. For the later years, the estimates of wages used are those furnished by Public Service Commissioner Barrett, and by the statistician of the American Electric Railway Association. Table 12C sets forth the evidence as it appears.

TABLE 12C

THE ESTIMATED DIVISION OF THE VALUE PRODUCT OF THE STREET AND ELECTRIC RAILWAYS OF THE CONTINENTAL UNITED STATES

(Values in Thousands of Dollars)

Year	Wages and salaries paid	Rents, interest, dividends, and surplus [h]	Total value product of industry [i]	Per cent of value product going to employees, as wages and salaries
1907.....	$150,991 [a]	$132,138	283,129	53.3
1909.....	170,900 [f]	154,800	325,700	52.5
1910.....	180,960 [f]	166,100	347,060	52.1
1911.....	191,400 [f]	177,000	368,400	52.0
1912.....	200,891 [a]	188,885	389,776	51.5
1913.....	213,950 [g]	192,400	406,350	52.7
1914.....	223,930 [cb]	195,900	419,830	53.3
1915.....	222,220 [cb]	199,100	421,320	52.7
1916.....	242,250 [db]	202,100	444,350	54.5
1917.....	267,240 [a]	205,159	472,399	56.6
1918.....	313,749 [e]	123,600	437,349	71.7

[a] *U. S. Census of Street and Electric Railways* for 1917, p. 13.
[b] Estimated from *Aera*, on basis of percentage change in cost of conducting transportation.
[c] *Aera*, Mar. 1917, p. 925.
[d] *Aera*, Mar. 1918, p. 795.
[e] Estimated in *Aera*, Aug. 1919, pp. 47–52.
[f] Interpolated along a smooth curve.
[g] Assumed to vary in proportion to operating expenses: see Barrett, Alfred M., *Annalist*, Jan. 5, 1920, p. 22.
[h] See Table 12B.
[i] Sum of two preceding columns.

§ 12d. Corporate Savings

Table 12C shows that, at the close of the period studied, there was a great increase in the share of the employees as contrasted with a sharp contraction in the share of property. As a rule, the corporate owners reserve a certain proportion of earnings as savings or "surplus." In 1918, however, the surplus disappeared and part of the distribution to stock and bond holders was made out of previous savings.

The estimates of the surplus for other years than those covered by the Census are interpolated on the basis of the reported surpluses of the twenty-eight representative companies previously mentioned and of the estimates of Public Service Commissioner Barrett. The figures appear in Table 12D.

They show that the percentage of corporate earnings saved fell sharply after 1911, but that about one-twentieth of the income was saved up to

1918, when a deficit occurred about equal to the savings of a normal year in the decade.

TABLE 12D

THE ESTIMATED CORPORATE SAVINGS OF THE STREET AND ELECTRIC RAILWAY COMPANIES OF THE CONTINENTAL UNITED STATES

(Values in Thousands of Dollars)

A	B	C	D	E	F	G
Year	Surplus of all companies in census years [a]	Surplus of 28 typical companies [b]	Ratio of B to C	Estimated savings of all companies C × D	Total share of entrepreneurs and property [f]	Per cent of share of entrepreneurs and property owners saved by corporations, as surplus E ÷ F
1907...	$14,303	$7,038	2.032 [c]	$14,303 [a]	$132,138	10.8
1909...		7,261	1.920 [d]	13,940	154,800	9.0
1910...		8,968	1.861 [d]	16,690	166,100	10.0
1911...		9,117	1.801 [d]	16,420	177,000	9.3
1912...	16,663	9,550	1.745 [c]	16,663 [a]	188,885	8.8
1913...		6,392	1.685 [d]	10,770	192,400	5.6
1914...				13,300 [e]	195,900	6.8
1915...				11,700 [e]	199,100	5.9
1916...				10,000 [e]	202,100	4.9
1917...	8,506			8,506 [a]	205,159	4.1
1918...				—12,100 [e]	123,600	—9.8

[a] *U. S. Census of Street and Electric Railways*, 1917, p. 14.
[b] Compiled from Poor's and Moody's *Manuals*.
[c] Computed.
[d] Interpolated along a straight line.
[e] Adjusted slightly to include surplus of lessor companies, but primarily the estimates of Alfred M. Barrett, in the *Annalist*, Jan. 5, 1920, p. 22.
[f] See Table 12B.

§ 12e. Average Annual Earning of Employees

The next question of interest is whether the average annual earnings of the employees attached to the industry are, in general, growing larger or smaller as the years pass. Since the purchasing power of the dollar has changed so greatly during the decade, it is also essential that the nominal money wage received by the average employee attached to the industry be divided by a suitable price index in order to ascertain the relative amounts which the various money payments would purchase on the dates when they were made. These two processes have been carried out in Table 12E.

TABLE 12E

THE AVERAGE NUMBER OF ELECTRIC RAILWAY EMPLOYEES AND THE AVERAGE ANNUAL PAY WHICH THEY RECEIVE FROM THE EMPLOYING COMPANIES

A	B	C	D	E	F	G	H
Year	Estimated average number of employees actually at work *f*	Estimated fraction of full time worked on the average *d*	Estimated number of employees attached to industry B ÷ C	Estimated total wages and salaries *a* (Thousands)	Average money earnings per year *d* E ÷ D	Average price index of goods consumed by manual and clerical workers *e*	Purchasing power of annual earnings at prices of 1913 F ÷ G
1907	221,429 *g*	.987	224,300 *b*				
1909	251,800 *f*	.968	260,000 *c*	$170,900	$657	95.5	$688
1910	266,100 *f*	.977	272,200 *c*	180,960	665	97.8	680
1911	273,600 *f*	.970	282,000 *c*	191,400	679	98.4	690
1912	282,461 *g*	.978	289,000 *b*	200,891	695	99.4	699
1913	284,100 *f*	.971	292,500 *c*	213,950	731	100.	731
1914	278,200 *f*	.942	295,000 *c*	223,930	759	101.	751
1915	276,000 *f*	.929	296,700 *c*	222,220	749	103.	727
1916	292,300 *f*	.982	298,000 *c*	242,250	813	110.	739
1917	294,826 *g*	.986	299,000 *b*	267,240	894	129.	693
1918	292,400 *f*	.977	299,700 *c*	313,749	1047	158.	663

a See Table 12C.
b Equals B ÷ C.
c Read from a smooth curve.
d Derived by means of a special study; see § 2d.
e Bureau of Labor index for middle of year, continued back from 1913 to 1909 by special investigation by this Bureau; see Table 2C.
f Equals C × D.
g *U. S. Census of Electric Railways*, 1917, p. 13.

The fractions which have been estimated as representing the proportions of those normally employed, who are at work, are based upon rather slender evidence. Probably, however, they do not diverge far from the truth. Their derivation is described in Chapter 2.

The results of the computations recorded in Table 12E show a distinct increase in the purchasing power of earnings during the first half of the decade and an equally distinct decline from 1914 to 1918. The conclusion must be that, during the latter period, either the employees grew worse off economically, or else there was a lowering in the grade of labor employed.

§ 12f. Purchasing Power of Share of Security Holders and Property Owners

It seems probable, then, that the employees were not quite as well off in 1918 as in 1909, but how about the investors? Owing to the variations in

the price level, a mere statement of the number of dollars which the latter received throws but little light upon the question. It is essential that the amounts in money be reduced to a basis of purchasing power, if an intelligent answer is to be given. This has been done in Table 12F. The price index used for the correction represents approximately the changes in the value of consumption goods used by the wealthy, since the majority of the stock in most corporations is held by persons having large incomes.

TABLE 12F

THE PURCHASING POWER OF THE BUSINESS SAVINGS AND OF THE DISBURSEMENTS MADE TO THE PROPERTY OWNERS FROM THE NET VALUE PRODUCT OF THE STREET AND ELECTRIC RAILWAY INDUSTRY

(Values in Thousands of Dollars)

Year	Corporate savings			Bond interest, dividends, and rent		
	Actual value [b]	Index of construction costs [a]	Value at prices of 1913 [e]	Actual amount paid [c]	Index of prices of articles used by families spending $25,000 annually [d]	Value at prices of 1913 [e]
1909 . .	$13,940	.927	$15,038	$140,860	.973	$144,769
1910 . .	16,690	.953	17,513	149,410	.988	151,225
1911 . .	16,420	.945	17,376	160,580	.995	161,387
1912 . .	16,663	.983	16,951	172,222	1.000	172,222
1913 . .	10,770	1.000	10,770	181,630	1.000	181,630
1914 . .	13,300	.960	13,852	182,600	1.010	180,792
1915 . .	11,700	.992	11,794	187,400	.996	188,152
1916 . .	10,000	1.194	8,375	192,100	1.074	178,864
1917 . .	8,506	1.473	5,775	196,653	1.198	164,151
1918 . .	—12,100	1.499	—8,067	135,700	1.364	99,487

[a] Data derived from reports of the United States Bureau of Labor Statistics. Weights used: Building labor 3, metals and implements 2, building materials 1.
[b] See Table 12D.
[c] Entire share of propertied classes less corporate savings; see Table 12B.
[d] Derived by a special study; see Table 2E.
[e] Obtained by dividing the money values by the price index.

Table 12F shows how very sharp has been the fall in the purchasing power of the income of the investors in street railways. Much more calculation is necessary to ascertain the decline in the real earnings per dollar invested. However, it seems quite certain that the investment has been all the time increasing rather than diminishing; hence it is evident, that from 1910 to 1918, street railway securities were constantly giving poorer and poorer returns on the investment.

§ 12g. The Average Output per Employee

Another query of interest is whether the output per employee has been increasing or diminishing during the decade under discussion. An increase in output might be due either to greater efficiency in management, better equipment, or greater skill or effort on the part of the employees. At present, only the facts and not the causes will be considered. The best measure of output is believed to be the car mile, which also seems to represent the best criterion of service rendered by the company. Cars have changed only moderately in size during the decade under discussion but there has apparently been some increase in capacity and it is not certain that the number of passengers crowded into a car may not have varied greatly. No record of seat miles is obtainable; hence the car mile is used as the nearest approximation to this ideal measure of service rendered. Table 12G shows roughly the facts both as to service per employee and service rendered per capita for the population of the Continental United States.

TABLE 12G

THE ESTIMATED NUMBER OF REVENUE CAR MILES PER EMPLOYEE AND PER CAPITA FOR THE STREET AND ELECTRIC RAILWAYS OF THE CONTINENTAL UNITED STATES

Year	Revenue car miles (Thousands)	Number of employees actually at work *f*	Revenue car miles per employee	Population of Continental United States *g* (Thousands)	Revenue car miles per inhabitant of the United States
1907.....	1,617,731 *a*	221,429	7,303	87,321 *h*	18.53
1909.....	1,725,000 *b*	251,800	6,851	90,370	19.09
1910.....	1,785,000 *b*	266,100	6,708	92,229	19.35
1911.....	1,845,000 *b*	273,600	6,743	93,811	19.67
1912.....	1,921,620 *a*	282,461	6,803	95,338	20.16
1913.....	2,000,000 *b*	284,100	7,040	97,278	20.56
1914.....	2,068,000 *c*	278,200	7,434	99,194	20.85
1915.....	2,022,000 *c*	276,000	7,326	100,428	20.13
1916.....	2,110,000 *d*	292,300	7,219	101.722	20.74
1917.....	2,139,802 *a*	294,826	7.258	103.059	20.76
1918.....	2,051,356 *e*	292,400	7,013	104,182	19.69

a *Census of Electric Railways*, 1917, pp. 12–13.
b Roughly estimated by aid of a smooth curve.
c Estimated from tables in *Aera*, March, 1917, p. 925.
d Estimated from tables in *Aera*, March, 1918, p. 796.
e Estimated from records of 345 companies; see *Aera*, Aug. 1919, p. 47.
f See Table 12E.
g Figures derived from a special study; see § 2a.
h *Statistical Abstract of the U. S.*, 1918, p. 776.

Table 12G indicates that the output per employee declined noticeably from 1907 to 1910, that, after that date, it varied irregularly, but in most years did not differ greatly from the 1907 rate. Since cars have probably increased somewhat in size it is not unlikely that the passenger miles per employee were greater in number in 1918 than in 1907. As to the effort involved in moving a car a mile, it may be noted that it has been affected by several varying forces. Larger cars require more work in collecting fares but improved devices lessen the physical work of manipulating the machinery. The car mile may then perhaps be a fairly satisfactory gauge of work performed, even though conditions have changed somewhat during the period studied.

§ 12h. Relative Growths of Street Car Service and National Population

The last column of the table shows that up to 1914 street railway service was growing faster than population but that since that date the two rates of growth have been about equal, with an actual decline occurring in 1918 in the car mileage per capita. This change in the amount of service per person in the United States has doubtless been the result of several independent forces acting simultaneously. The chief force tending to send the per capita amount of service upward is the relatively rapid growth of the urban as compared to the rural population. This tends to increase the average street car patronage among the general population, for, as cities grow larger, not only must a larger percentage of their inhabitants ride to work, but also each person who rides must, on the average, travel more miles to reach the business district.

Two forces acting in the opposite direction which have been especially potent in restricting traffic since 1914 are the increase in the automobile-owning percentage of the population and the competition of automobile busses with the street railways. During the period since 1917, the growth of street railway traffic has been further hampered by the fact that extensions could not readily be financed because of low net income arising from fixed rates of fare and higher costs of operation. In 1918, a further restricting factor of some moment was the difficulty of obtaining sufficient employees to keep the service in full operation.

Despite the decline in service occurring at the close of the recorded period, it seems probable that the car mileage per capita may again increase at a rate similar to that prevailing before 1915. The actual increase during the decade in service is probably slightly greater than the figures show, for it is presumably true that the average seating capacity of cars has grown somewhat in the interim.