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CAPITALIZATION OF ELECTRIC RAILWAYS



A Thesis
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of the
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Respectfully submitted,

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FOREWORD.

The electric railway is the most important electrical industry in the United States and one of the most important of its public utilities. As a carrier, it by far reaches the largest numbers of persons. In the year 1912 it carried 9,545,554,667 revenue passengers, against 1,004,081,346 carried by the steam railroads, and the number is constantly increasing. Of course the steam roads carry the passengers over longer distances with an average of 33 miles per ride. The average length of ride on electric railways is not known but certainly less than four miles. Over forty-one thousand miles of track was in use, and three and a half million horse power had been installed to pull cars to the number of almost a hundred thousand. This gigantic business has been made possible by a capitalization of \$4,708,568,141. To get an idea of the magnitude of this sum, it is only necessary to recall that the capitalization of steam railroads, which represent one-fifth of the total capitalization of all the industries in the country, is \$19,752,536,264. The gross income in 1912 was \$586,391,363, of which seventy million was available for dividends and ten million for surplus. The steam roads for the year ending June 30, 1914, made a gross income of \$992,518,783, paying dividends to the amount of over two hundred millions

and leaving another hundred million for surplus.

As soon as people began to appreciate the extent and tremendous importance of this enterprise, and the economic and social influence it has on the state, they took means to bring it into control with the result that one hears nowadays more and more of regulation of all public utilities. Public service commissions came into being in one state after another with varying degrees of power to deal with the electric railways. The central idea of regulation, however, is always the same, and that is to protect on one side the public from having to bear rates over and above an adequate return on a fair capitalization, and on the other, to protect the utility as against unjust demands of the public. The question of capitalization then looms up large in all talks of regulation of public utilities.

There is great diversity of opinion as to what constitutes fair capitalization and what adequate return. The railways are face to face with increasing costs of materials as well as operating costs chiefly on account of the rapid rise in wages, and many find the present fare inadequate for a proper return on their investment. Some are clamoring for increasing the fares; others already have been given permission to do so. On the other hand, the public urges better and better accommodations, and the municipality becomes more and more

stringent in its dealings with the railways, with increasing taxes and other privileges asked for its citizens in granting or renewing franchises. Some of the more enterprising municipalities took over the street railways altogether and operate them in the interest of the public. There is no way of telling whether municipal ownership actually works out better than regulation, for here again one finds many arguments on both sides of the question. But municipal ownership of electric railways has not as yet made much progress in the United States, and as long as these utilities are privately owned and operated the pertinent question is whether capitalization is fair or unfair and the return on it adequate or inadequate.

In any attempt to fix what is an adequate rate of return, one immediately is confronted with the question, "What is the proper basis of capitalization?" A road may be capitalized on the basis of its cost, or on the basis of its earning capacity. The cost, again, may be the original cost, the cost of reproduction of the original at present, or the cost of replacement by a similar property that will perform the same service as the original. This is but one aspect of the complex subject of capitalization.

Even a casual examination of electric railway statistics will show that the total capitalization is very

unevenly distributed, and that territories differ from one another in the amount of capitalization per mile of road or track, even as the individual railways differ from one another. One finds occasionally in this particular roads capitalized at as low as twenty thousand dollars per mile of track and again comes across others with ten times as much invested per mile. Territorial differences in this respect may not be so marked, but they easily vary from fifty thousand to one hundred and fifty thousand dollars per mile of track. Evidently there are many causes that lie back of such wide variations. It may be that the cost is widely different, or it may be the earning capacity, or it may be a host of other things connected with the construction and operation of the railway. This much, however, is apparent, and that is, no one factor is sufficient to determine for a railway its capitalization per mile.

In view of the important place that electric railways take among the industries, the increasing force and extent of regulation of public utilities, the prominent part that capitalization has played and is playing in all attempts at regulation, and the great complexity attached to this question of capitalization, it seems to be of timely interest to make a statistical study of the capitalization of electric railways in the United States, based on a comparison of conditions existing in different parts of

the country.

The authors at first intended to base this study in part on McGraw's Electric Railway Journals over a period of many years. These journals, however, do not attempt to segregate the statistics in a way suitable to a study of this problem; so both from observation and from the advice of the McGraw people, the Census of Electric Railways, the 1912 issue of which just appeared during the year, was adopted and found to be admirably suited to this purpose. The Census was supplemented by reports of state and city commissions, whenever interest so demands.

The authors wish to express their appreciation and thanks to Professor Harry Ellsworth Clifford for recommending this subject for study and for many advices and suggestions.

C O N T E N T S

	<u>Page</u>
1. Object and Scope	7
2. Development of Electric Rail- ways	8
3. Gross and Net Capitalization ..	10
4. Capitalization and Cost	21
5. Capitalization and Revenue	28
6. Capitalization and Classes of Securities	42
7. Capitalization and State	56
8. Conclusion	64

OBJECT AND SCOPE.

The object of this investigation is to make a critical comparison of different sections of the United States with respect to various phases of capitalization of the electric railways.

The electric railways include both the municipal and interurban lines, the former constituting about sixty per cent of the total mileage. An inconsiderable amount of roads operated with animal and cable, and of those using self-propelled cars are also included. practically all of the street and electric railways are operated under corporate ownership.

DEVELOPMENT OF ELECTRIC RAILWAYS.

Although the first electric railway operating on a practical scale was built by Siemens and Halske of Germany in 1879, the United States probably did the most in its practical development and in its establishment on a firm commercial basis. Since the year 1888 when Frank J. Sprague built the memorable electric road in Richmond, Virginia, the growth of electric traction in the United States has been phenomenal. The increase of the number of electric roads and miles of single track since 1889 is shown in Table I, and graphically on the curve. The effect of the panic of 1907 is strikingly depicted on the graph, where the bending over shows the amount of retardation that the panic imparted to the industry, and that persists to this day. The rate of growth as shown by the slope of the curve is still steady, only considerably deiminished as compared with the growth prior to 1907.

TABLE I.

GROWTH OF ELECTRIC TRACTION IN UNITED STATES.

Year	No. Electric Roads	Miles of Track
1889	50	100
1890	200	1,200
1891	275	2,250
1894	606	7,470
1895	880	10,863
1902	739	22,000
1907	904	34,000
1912	943	40,958

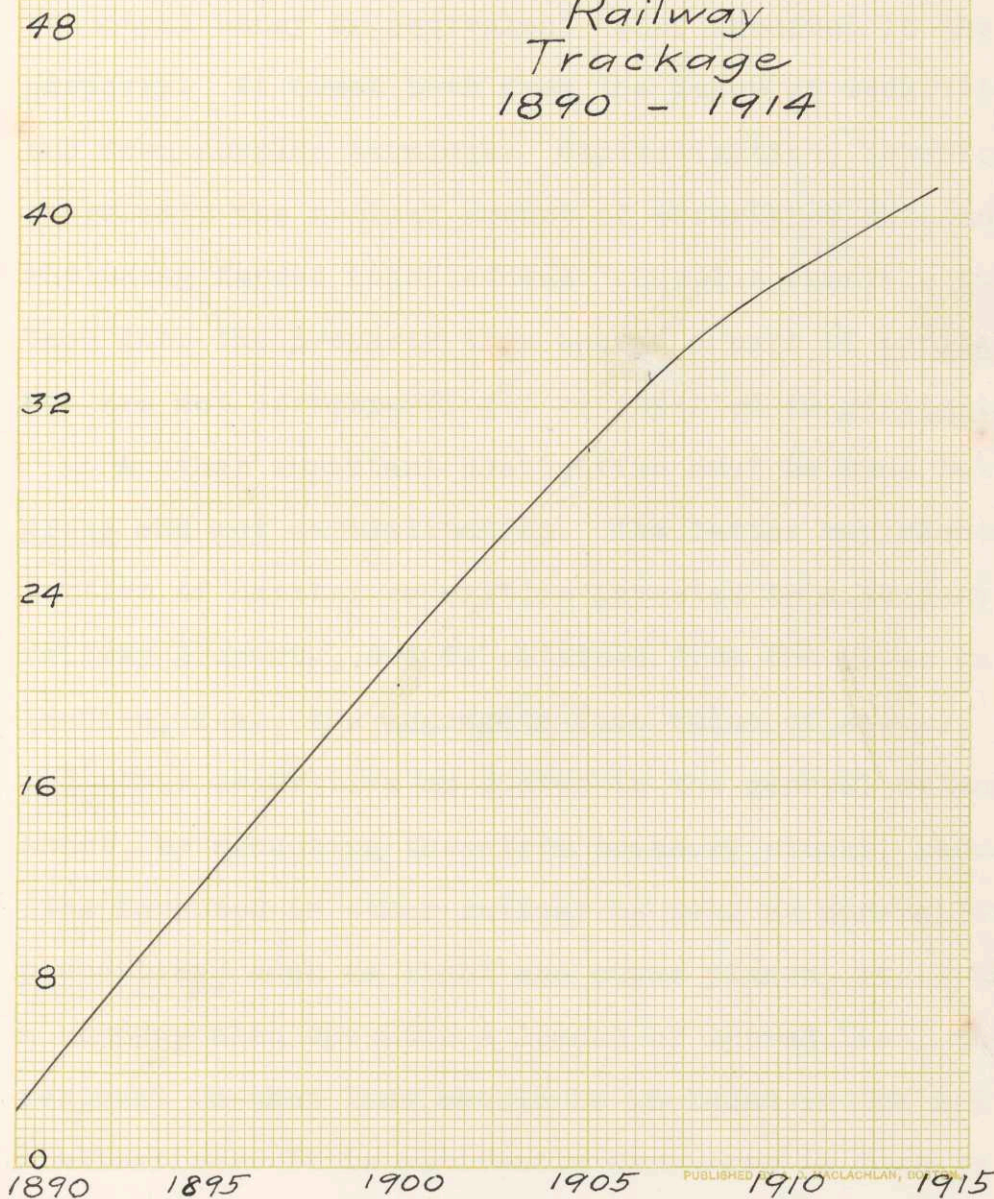
The period from 1890 to 1902 witnessed the change of animal traction to electrical, which was practically completed in 1907. From 1895 on till today, there has been many consolidations of electric roads, and consequently the increase of the number of roads has not been nearly proportionate with the increase of total mileage. The actual increase of the number of roads is even smaller, because several roads that really form one system declare themselves as independent companies on account of certain legal restrictions. It is interesting to note that the average road in 1912 operated approximately four times as much track and almost twice as many cars as in 1890.

The increase in miles of track while giving the most satisfactory indication of the growth of the industry is not the only factor which should be considered in tracing the electric railway development. The percentage increases during two five-year census periods of trackage, capitalization, revenue passenger traffic, and gross revenue are compared in the following table, which may be considered as the progress of the electric railways in a nutshell:

	1902-1907	1907-1912
Track Mileage	51.5%	19.5%
Par Value of Stocks and Bonds Out- standing	63.5%	24.7%
Revenue Passenger Traffic	55.9%	28.3%
Gross Revenue	71.6%	36.3%

Thousands
of Miles
Single Track

Growth of Electric Railway Trackage 1890 - 1914



GROSS AND NET CAPITALIZATION.

According to Doctor A. M. Sakolski of New York University, there is the following difference between Capital and Capitalization. "Capital is the amount of actual money or equivalent value invested in the property. It comes both from the issue of securities and from surplus earnings. Capitalization, however, represents the nominal amount of securities outstanding, including funded indebtedness. Surplus earnings turned back into the property thus become a part of capital, but are not correspondingly represented in capitalization."

Another important distinction must be made between gross and net capitalization. The latter represents the portion of capital securities invested in a company's own railway property, and is obtained from the gross capitalization, i.e., the aggregate face value of stocks, bonds and other securities as stated in the general balance sheet, by deducting therefrom treasury stocks, securities invested in other railway as well as non-railway properties, such as light and power plants, etc. When a company also operates a leased or rented line, the investment in that line should be included in the net capitalization. It is manifestly erroneous to measure the capitalization of a road on a per mile basis, when a large part of this arises from the acquisition of subsidiary

lines and of other enterprises, or when leased lines are operated without taking over the corresponding investments. The length of single track operated by the Boston Elevated Railway Company is 511 miles, and its net capitalization is \$46,645,590. If this is reduced to a per mile basis, the result will be very far from the truth. To obtain the correct amount of capitalization, it is necessary to include:

Boston Elevated investment	\$ 46,645,590
Leased lines:	
West End Street Railway property..	40,472,254
Bay State " " " ..	983,715
Rented Subways	
City property	<u>16,918,029</u>
Total Net Capitalization	\$105,019,588

This amounts to about \$200,000 net capitalization per mile, chargeable to the track.

In Table II is shown the gross and net capitalization for the country every five years since 1890. It was from 1890 to 1902 that most of the pioneer work in the industry was done, and the horse replaced by electricity on most of street railways. Therefore the increase of capitalization per mile during this period was enormous. Since 1902 the increase has been small but steady.

TABLE II.

Capitalization: 1890 to 1912.

	1912	1907	1902	1890
Capitalization Gross	4,708,568,141	3,774,772,096	2,308,282,099	449,053,669
Capital stock ...	2,379,346,313	2,097,708,856	1,315,572,960	272,441,843
Funded debt	2,329,221,828	1,677,063,240	992,709,139	176,611,826
Investments in stocks and bonds of other companies, treasury securities, and oth- er permanent invest- ments	465,250,414	374,664,197	152,513,997	
Capitalization less investments	4,243,317,727	3,400,107,899	2,155,768,102	.....
Average capitaliza- tion, Net:				
Per mile of line	141,484	134,961	130,560	98,848
Per mile of track	104,930	100,495	96,287	.....

TABLE III A.

CAPITALIZATION AND REVENUE

by Geographical Divisions; 1902, 1907, and 1912.

Division	Net Capitalization per Mile		
	1912	1907	1902
United States	104,851	100,495	96,287
New England	61,577	54,724	45,411
Middle Atlantic ...	134,374	140,724	143,284
E. N. Central	87,078	87,292	85,122
W. N. Central	97,807	102,948	106,125
South Atlantic	125,409	112,013	114,289
E. S. Central	92,051	93,925	70,742
W. S. Central	93,021	100,083	67,405
Mountain	77,514	76,358	58,406
Pacific	145,428	102,272	82,761

150,000 Dollars

Net Capitalization
1912 (Solid black)
1907 (Red)
and 1902 (Broken line)

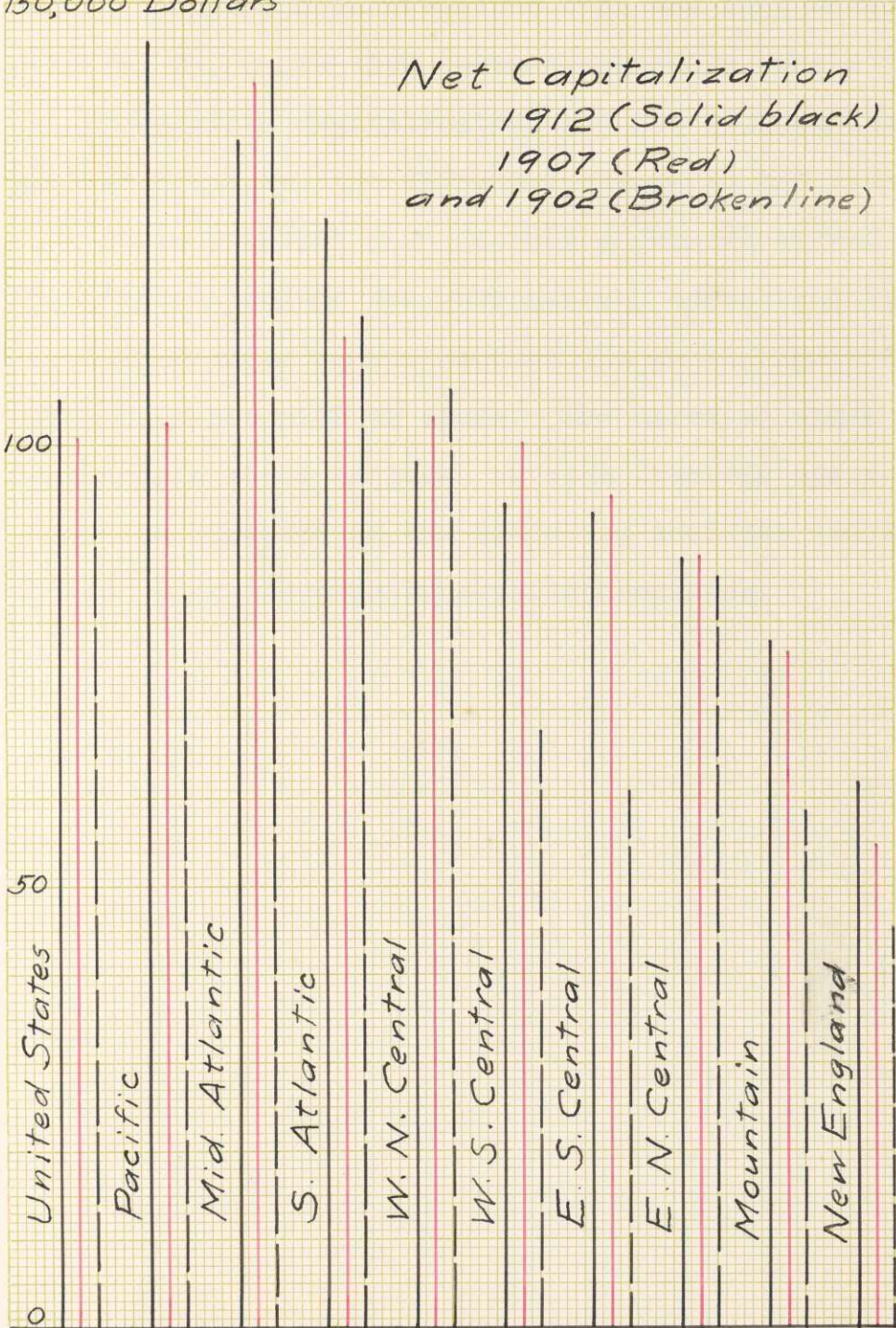
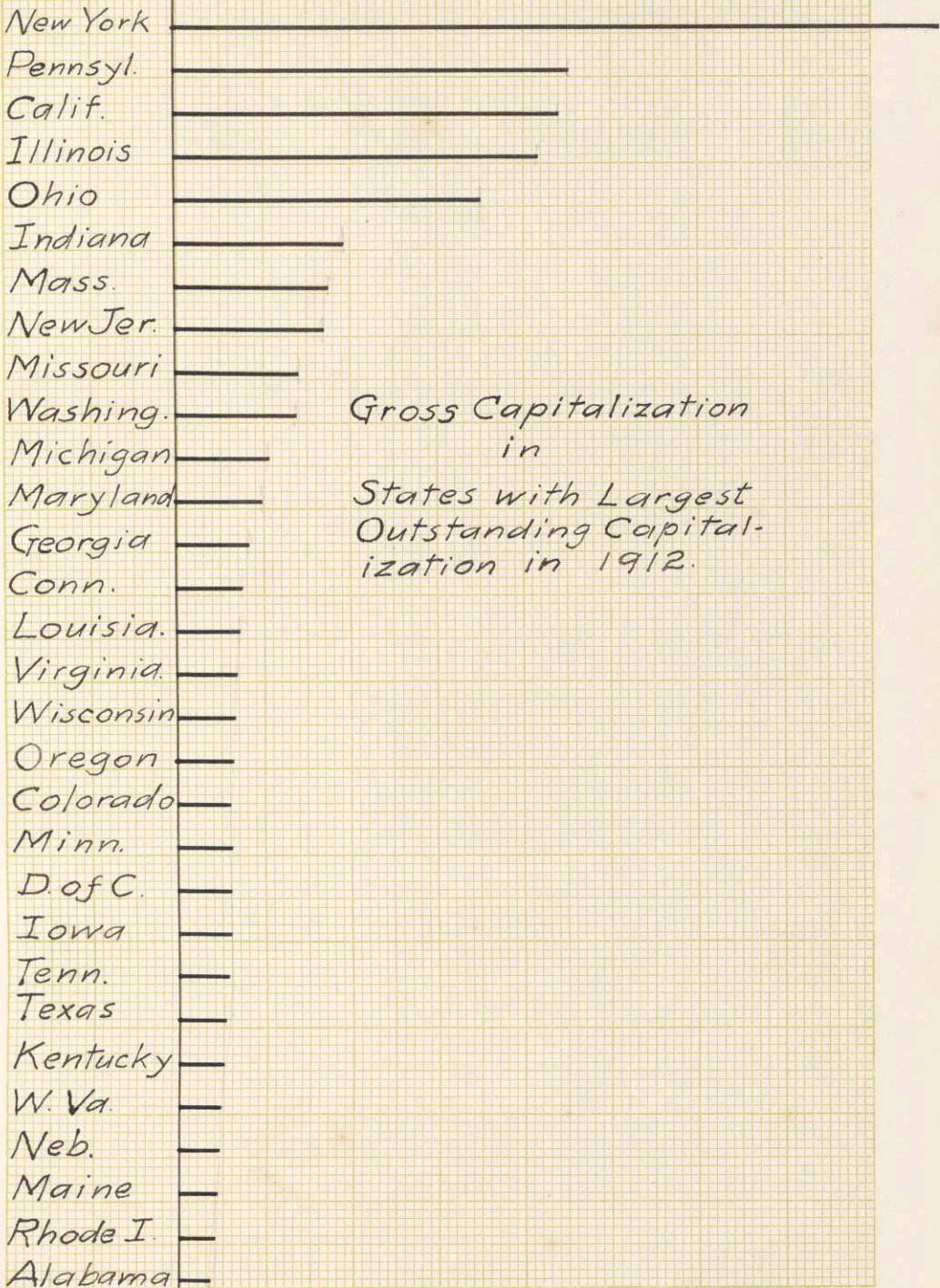


Table IIIa shows changes in capitalization per mile for the geographical divisions over the last three census periods, which are also shown graphically, while Table III gives gross capitalization and net capitalization per mile of track for the different states in the year 1912.

It is proposed here to make a general survey of the country and compare the geographical variations in total amounts of gross capitalization and in average net capitalization per mile of track. The miles of track operated within a state excludes outside trackage operated by companies credited to the state and includes trackage within the state operated by outside companies.

Hundreds Millions of Dollars

0 1 2 3 4 5 6 7 8



Gross Capitalization
in
States with Largest
Outstanding Capital-
ization in 1912.

TABLE III

GROSS AND NET CAPITALIZATION IN DIFFERENT STATES--1912.

State	No. of Co.	Miles Track Operated	Gross Capitalization	Net Capitalization Per Mi. Tr.
Maine	17	530.49	35,144,207	52,022
New Hampshire ..	13	268.15	6,485,400	30,065
Vermont	9	120.83	5,661,658	51,310
Massachusetts ..	60	2,950.96	174,520,275	57,786
Rhode Island ...	8	435.37	33,158,700	79,037
Connecticut	12	947.69	79,113,200	80,232
<u>New England</u>	119	5,299.02	334,083,440	61,577
New York	134	4,485.81	870,590,850	184,612
New Jersey	43	1,308.97	171,689,176	131,833
Pennsylvania ...	259	4,269.53	471,300,884	81,261
<u>Middle Atlantic</u> .	436	10,064.31	1,513,580,910	134,374
Ohio	88	3,999.22	350,573,490	72,139
Indiana	45	2,323.38	191,331,922	78,381
Illinois	72	3,185.73	407,354,547	127,803
Michigan	23	1,526.25	102,107,230	64,083
Wisconsin	25	849.11	72,297,920	72,716
<u>E. N. Central</u> ..	253	11,883.69	1,123,665,109	87,078
Minnesota	9	538.48	55,899,200	101,370
Iowa	26	783.87	53,536,119	65,882
Missouri	19	959.01	139,246,050	137,547

State	No. of Co.	Miles Track Operated	Gross Capitalization	Net Capitalization Per Mi. Tr.
N. Dakota	3	19.18	784,555	30,152
S. Dakota	2	21.59	790,350	36,607
Nebraska	10	214.46	35,223,276	112,270
Kansas	21	493.91	28,860,125	60,644
<u>W. N. Central</u> ..	90	3,030.50	314,379,675	97,807
Delaware	8	99.37	10,553,200	97,175
Maryland	17	719.74	96,342,800	135,575
Dist. of Col. ..	7	188.46	53,812,268	206,638
Virginia	20	561.49	72,330,700	129,178
W. Virginia	24	330.18	37,926,000	82,875
N. Carolina	15	190.26	23,923,300	89,221
S. Carolina	7	228.08	13,049,305	59,083
Georgia	15	417.33	82,930,000	175,785
Florida	10	164.84	11,149,100	68,247
<u>S. Atlantic</u>	123	2,899.75	402,016,673	125,409
Kentucky	10	502.38	39,262,150	69,347
Tennessee	12	360.93	49,579,000	130,953
Alabama	12	308.80	29,999,500	87,115
Mississippi	12	118.57	9,625,494	77,316
<u>E. S. Central</u> ..	46	1,290.68	125,466,144	92,051
Arkansas	10	113.72	12,665,856	103,135
Louisiana	15	285.10	77,376,064	195,856
Oklahoma	18	251.56	17,995,050	68,608
Texas	40	721.42	44,196,904	58,999
<u>W. S. Central</u> ..	83	1,371.80	152,233,874	93,021

State	No. of Co.	Miles Track Operated	Gross Capitalization	Net Capitalization Per Mi. Tr.
Montana	6	99.22	6,146,752	51,727
Colorado	17	467.97	56,183,680	92,981
New Mexico	2	10.60	516,000	48,679
Arizona	4	46.24	5,279,500	106,872
Idaho	4	129.13	9,274,609	88,834
Wyoming	2	22.91	895,000	37,966
Nevada	2	11.27	1,180,695	104,676
Utah	5	260.18	14,742,950	55,800
<u>Mountain</u>	42	1,047.52	94,219,186	77,514
Washington	20	991.17	136,246,008	122,145
Oregon	6	549.19	69,436,576	120,474
California	42	2,605.28	441,280,546	160,131
<u>Pacific</u>	68	4,145.64	645,963,130	145,428
<u>United States</u> ..	1,260	41,032.91	4,708,568,141	104,851

In some states, more expensive means of rapid transit exist in the way of elevated structures and subways, thereby raising the capitalization per mile. In many others as a result of investments in power plants and in distributing installations for light and power departments the net capitalization per mile of track is greatly inflated, especially in Georgia, Tennessee, Oregon, Virginia and Washington.

The part that the small group of elevated and subway systems did in boosting the capitalization per mile may be seen from the following:

	Total	Surface	"L" & Subway
Number of companies	1,260	1,251	9
Miles of track	40,439.40	39,931.07	508.33
Total Capitalization	\$4,708,568,141	4,269,747,791	438,820,350
Net Capitalization	4,243,317,727	3,827,452,424	415,865,303
Net Capitalization per mile of track	104,930	95,851	818,101

Aside from local conditions affecting capitalization in other ways, geographical situation per se does not seem to cause any marked change. Thus New England is much nearer the Middle Atlantic States than the Pacific di-

vision, and yet the latter has a capitalization per mile much more compatible with that of Middle Atlantic than New England. However, the conditions in the Pacific are abnormal and unstable, as compared with the stage of development reached by those on the Atlantic coast. The graphic representation of the net capitalization for the years 1902, 1907 and 1912, shows either a small uniform increase or a similar decrease for sections of the country like Middle Atlantic, New England and the North Central divisions, but shows unsteady conditions in the south and west, notably in the Pacific states, where the net capitalization per mile jumps from \$82,761 to \$145,428 in a decade, from fourth in rank, according to this feature, to the head of the list, outstripping even the Middle Atlantic.

One needs here to be reminded of the words of Professor A. Z. Ripley to the effect that the amount of capitalization per mile cannot be taken as a sure index of the financial condition of a road, and that a high capitalization per mile does not necessarily indicate overcapitalization. In order to determine whether the capitalization is excessive we must know something of the value of the property and equipment, the nature of the territory served, and the interest and terms of the securities. The following case mentioned of the steam roads by the professor applies just as well to the electric railways. A road with valuable holdings and growing volumes of traffic

drawn from a prosperous territory, and borrowing at low rates can maintain without injury to the public a much higher capitalization per mile than one in opposite circumstances. The latter may not earn anything on a small capitalization, while the former may pay good dividends and yet give the public comparatively low rates. This leads to the study of capitalization first in relation to the cost of the road.

CAPITALIZATION AND COST OF THE ROAD.

Theoretically the cost of a property is the only proper basis of its capitalization. In practise, however, it is impossible to differentiate that part of capitalization which represents actual investment that has gone into the cost of a road, which includes the cost of construction, equipment, and real estate, from that which represents the less tangible factors like franchise values, earning power or stock bonus.

In general the electric railways insert in their books for the cost of their roads amounts that approximate the par values of their outstanding stocks and bonds. Exceptions, however, are by no means infrequent, owing to the practise followed by some companies of reinvesting surplus earnings in plant and equipment without a corresponding increase in capitalization. An instance may be mentioned here. In 1902 a certain road reported to the Census Bureau a capitalization of less than \$2,500 per mile of track, which is decidedly small. The road had been appropriating the surplus earnings, over and above moderate dividends, to new constructions and equipments. During the following years the capital stock was increased, so that in 1907 the road reported a capitalization per mile of \$60,000 which was about the average for the majority of the companies of this size.

Further complexity was thrown into the problem when the company sells light and power in addition to operating a railway, like many of the roads in the South. It is manifestly impossible to apportion the capitalization among the track, power plants, etc.

The following table compares net capitalization with the cost of the roads for the country at the last three census years:

	1912	1907	1902
Cost	4,596,563,292	3,537,668,708	2,167,634,077
Capitalization	4,243,317,727	3,400,107,899	2,177,619,302
Per cent of cost	92.5	93.5	97.7

Although these figures for the cost are not to be relied on too seriously, the decreasing percentage that capitalization bears to the cost would still indicate that improvements in the way of new constructions and equipments were not fully and promptly capitalized.

Table IV compares net capitalization and cost of the road for the different states. In most of the states, the capitalization per mile comes to within ten per cent below the amount of cost per mile; in about a dozen of the states to within twenty per cent, and only in four states does the capitalization exceed the cost to any considerable degree. It does not follow that the last four

states over-capitalize their roads more than others, for the figures given for the cost, as already mentioned, are more or less arbitrary owing to the inclusion to a greater or less extent of power plants, franchise values, etc. The wide range of values given for the cost per miles of track, from \$26,200 in New Hampshire, to \$201,000 in Georgia, is certainly too wide a range for the actual cost, and only emphasizes the arbitrary character of the values given. It must be borne in mind, however, that the cost of a road is a very difficult thing to determine, and even the proprietors of a road would find it almost impossible to get at its true cost. In fact, engineers of equal prominence are known to arrive at quite different values for the cost of a road during an appraisal.

In view of the close supervision that has been exercised by the Railroad Commission of Massachusetts over capitalization of its public service corporations, the following cost and investment statistics of that commonwealth should be useful as a means of comparison. (*See Table V*)

TABLE IV

CAPITALIZATION AND COST OF THE ROAD

State	Miles of Track	Cost of Construction, Equipment Real Estate	Cost per Mile	Capitalization	
				Per Mile	Per Cent of Cost
Maine.....	530 .49	28,479,941	53,750	52,022	96 .8
New Hampshire .	268 .15	7,011,443	26,200	30,065	114 .7
Vermont	120 .83	6,073,617	50,250	51,310	102 .0
Massachusetts .	2,950 .96	194,677,690	66,000	57,786	96 .3
Rhode Island..	435 .37)	118,362,483	85,600	79,640	93 .0
& Connecticut .	947 .69)				
<u>New England...</u>	5,299 .02	354,605,174	67,000	61,577	91 .8
New York	4,495 .81	913,345,909	200,380	184,612	90 .3
New Jersey ...	1,308 .97	176,912,642	135,000	131,833	97 .6
Pennsylvania..	4,269 .53	381,537,166	89,400	81,261	91 .0
<u>Middle Atlantic</u>	10,064 .31	1,471,795,717	146,500	134,374	91 .9
Ohio	3,999 .22	323,609,762	80,800	72,139	89 .2
Indiana	2,323 .38	193,842,423	83,400	78,381	94 .0
Illinois	3,185 .73	406,577,828	127,300	127,803	100 .2
Michigan	1,526 .25	109,694,970	71,900	64,083	89 .2
Wisconsin	849 .11	65,558,498	77,400	72,716	94 .0
<u>E. N. Central.</u>	11,883 .69	1,099,283,481	92,500	87,078	94 .2
Minnesota	538 .48	60,781 .293	113,000	101,370	90 .0
Iowa	783 .87	60,135,647	76,900	65,882	85 .8
Missouri	959 .01	158,721,248	165,600	137,547	83 .1

State	Miles of Track	Cost of Construction, Equipment, Real Estate	Cost per Mile	Capitalization	
				Per Mile	Per cent of Cost
N. Dakota	19.18)	1,517,890	37,300	33,380	89.5
S. Dakota	21.59)				
Nebraska	214.46	28,670,146	133,500	112,270	84.4
Kansas	493.91	26,982,227	54,700	60,644	111.0
<u>W. N. Central</u> .	3,030.50	336,808,451	111,100	97,807	88.2
Delaware	99.37)	147,147,538	146,200	145,400	99.5
Maryland	709.74)				
D.of Columbia.	188.46)				
Virginia	561.49	66,483,222	138,300	129,178	93.5
W. Virginia ..	330.18	34,958,364	106,000	82,875	78.2
N. Carolina ..	190.26	18,819,628	99,000	89,221	90.0
S. Carolina ..	228.08	12,708,219	55,800	59,083	105.7
Georgia	417.33	83,962,495	201,000	175,785	87.1
Florida	164.84	11,388,431	69,000	68,247	98.7
<u>S. Atlantic</u> ...	2,899.75	375,467,897	129,400	125,409	96.8
Kentucky	502.38	36,301,326	72,400	69,247	95.7
Tennessee	360.93	49,355,376	136,300	130,953	96.0
Alabama	308.80	29,239,743	94,800	87,115	92.0
Mississippi ...	118.57	9,223,302	77,700	77,316	99.4
<u>E.S. Central</u> ..	1,290.68	124,119,747	96,100	92,051	95.8
Arkansas	113.72	12,985,385	114,200	103,135	90.4
Louisiana	285.10	57,175,403	200,000	195,856	97.8
Oklahoma	251.56	17,456,621	69,500	68,608	98.7
Texas	721.42	48,678,202	67,500	58,999	87.5
<u>W. S. Central</u> .	1,371.80	136,295,611	99,500	93,021	93.5

State	Miles of Track	Cost of Construction, Equipment, Real Estate	Cost per Mile	Capitalization	
				Per Mile	Per Cent of Cost
Montana	99.22	5,957,245	60,150	51,727	86.0
Colorado	467.97	45,575,992	97,500	92,981	95.4
New Mexico ...	10.60)	4,951,805	87,200	96,000	110.0
Arizona	46.24)				
Idaho	129.13)	34,049,694	80,600	66,200	82.0
Wyoming	22.91)				
Nevada	11.27)				
Utah	260.18)				
<u>Mountain</u>	1,046.52	90,534,736	86,500	77,514	89.5
Washington ...	991.17	136,195,547	137,300	104,676	76.0
Oregon	549.19	76,935,219	140,000	120,474	86.0
California ...	2,605.28	394,521,712	151,000	160,131	106.0
<u>Pacific</u>	4,145.64	607,652,478	146,800	145,428	99.2
<u>United States</u> .	41,032.91	4,596,563,292	112,000	104,851	92.5

Comparison between
Cost per Mile (Black)
and
Capitalization
per Mile (Red)

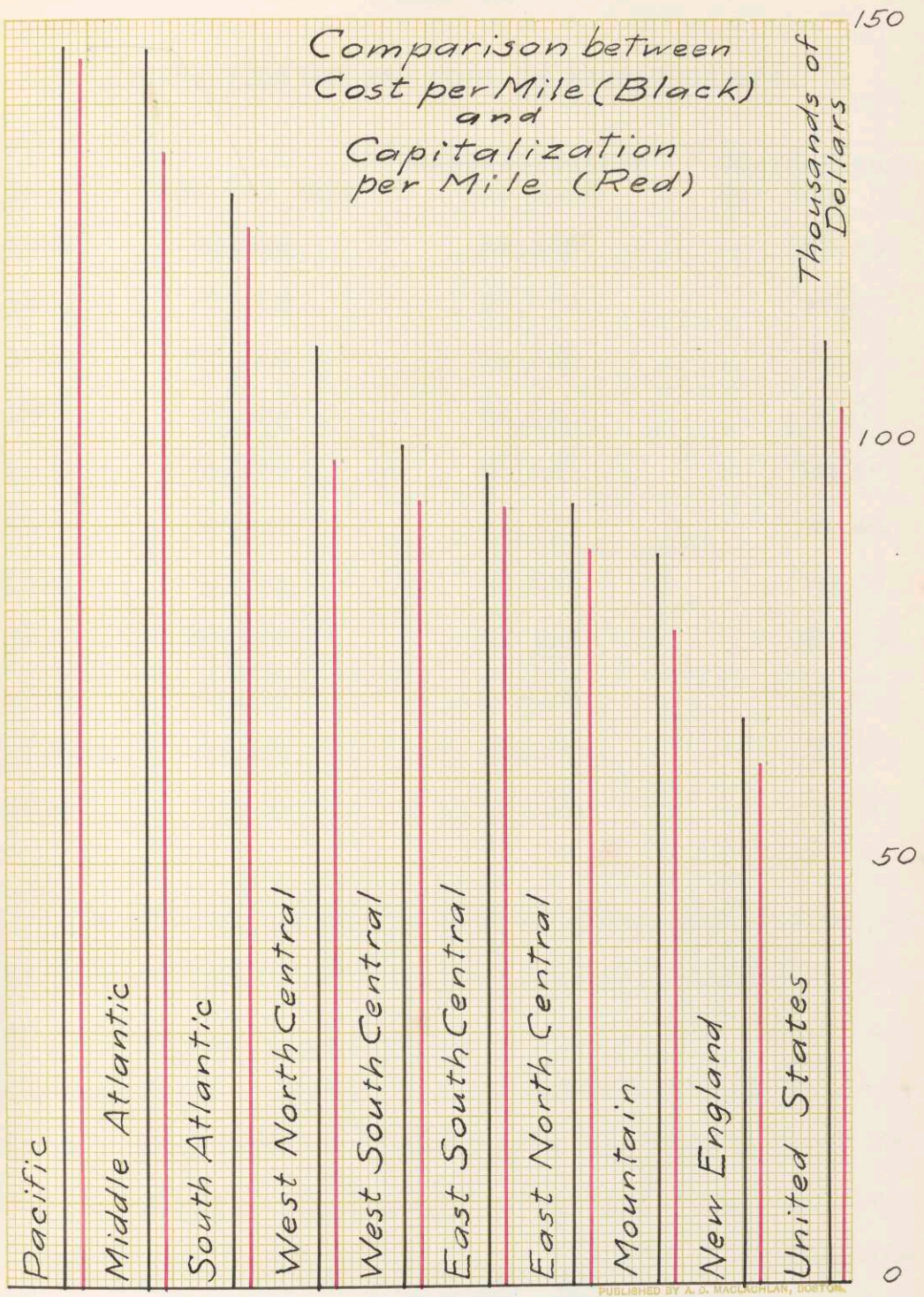


TABLE V.

CAPITALIZATION AND COST IN MASSACHUSETTS.

Year	Cost Per Mile	Capitalization Per Mile	Capitalization Per Cent of Cost
1904	50,308	50,295	99.90
1905	51,309	50,772	99.00
1906	52,802	52,535	99.40
1907	55,428	55,624	100.30
1908	57,677	57,521	99.60
1909	58,580	58,337	99.60
1910	61,732	61,673	99.80
1911	64,226	63,268	98.50
1912	68,503	67,679	98.80
1913	68,881	68,623	99.70
1914	70,646	70,179	99.30

An average of a thousand miles of electric railway in Great Britain for 1905 gives a capitalization per mile of £14,500, which is a little over the 1914 figure for Massachusetts. If \$70,000 per mile of track is assumed to be a fair value of capitalization, knowing that track and equipment in Massachusetts are in no way inferior to those in the other parts of the country, consideration of the cost alone would implicate the majority of electric railways in this country in excessive capitalization.

CAPITALIZATION AND REVENUE.

Next to the cost, the earning power of a road is generally supposed to determine its capitalization, since it is with the biggest roads that one usually finds the largest amounts of capitalization total as well as per mile of track.

The following table gives a comparison of three classes of railways adopted by the Interstate Commerce Commission on the basis of income from railway operations:

	CLASS A	CLASS B	CLASS C
Income	\$1,000,000 and over	From \$ 250,000 to 1,000,000	Below \$250,000
Number of companies..	283	217	760
Miles of track	20,976	9,544	9,919
Total Capital- ization ...	\$3,251,909,701	\$825,806,276	\$630,852,164
Per Cent	69.1	17.5	13.4
Net Capitaliz- ation per mile of track	\$ 140,254	77,367	56,763

It is noteworthy that companies of the Class A operate over one-half of the trackage in the country, furnish seventy per cent of total capitalization and show a net capitalization per mile nearly double that of the next Class.

It was, therefore, proposed to enter further into the relation between revenue and capitalization.

Data were obtained for all of the states in the year 1912, comparing net capitalization per mile of track and gross operating revenue per mile of track. The last was used instead of gross income from all sources in order to be consistent with the net capitalization. The operating revenue is the amount of revenue properly chargeable to track.

A curve was plotted between operating revenue as abscissa and capitalization as ordinate, and the result is shown in a following sheet. The logarithmic trend of the curve indicates that the net capitalization per mile of track increases at a rate greater than proportionate to the growth of operating revenue per mile of track. In other words, when a road yields an increasing revenue per year, it somehow finds it necessary to increase its capitalization and that an an even faster rate than what is warranted by the growth of earnings.

A similar plot is made for the State of Massachusetts, where on account of close state regulation, capitalization is made to accord with the actual investment quite faithfully. There is this difference, however, that whereas in the plot for the United States, the different points represent the states, in this, they represent the succeeding years; consequently the points lie

pretty well along the curve. As before, the logarithmic trend is present. The abscissae have not been reduced to the per mile basis on account of lack of data on track mileages for the different years. Evidently, had the per mile revenue been used instead of the gross, the upward trend of the curve would be enhanced, inasmuch as the increase of revenue per mile of track is smaller than the increase of gross revenue owing to the increasing trackage from year to year.

One step further, and a plot was made for a big metropolitan railway system, to some extent typical of its kind in the country. The system is that of the Boston Elevated Railway Company, which operates today over five hundred miles of elevated, subway and surface trackage in and around the city of Boston.

The operating revenue per mile increased during 1888-1913 from \$21,100 to \$33,200, or by thirty-three per cent, while the net capitalization jumps from \$50,400 per mile to \$206,000, or just four hundred per cent. The curve which covers this period has the characteristic trend that was seen in the others larger in scope. Much of the increase in capitalization of this road is credited to the investment of about seven million dollars by the city to subway systems which are leased to the company at rentals of four and one-half or four and three-quarters per cent, rates which are calculated to provide sinking

fund as well as interest. The company is by no means enthusiastic over this heavy investment in subways, which for the last three years has been the alleged cause for leaving a deficit on the balance sheet.

What is true of the Boston Elevated Railway should be true also of Massachusetts or of the United States to a more or less extent, i. e., as soon as a road begins to earn a handsome revenue, the public demands better facilities, with the result that the road has to increase its capitalization more than it would under normal circumstances.

TABLE VI

CAPITALIZATION AND REVENUE IN DIFFERENT STATES IN 1912

State	Capitalization per Mile of Track	Operating Revenue per Mile of Track
<u>New England</u>		
Maine	52,022	6,630
New Hampshire	30,065	4,650
Vermont	51,310	4,975
Massachusetts	57,786	12,470
Rhode Island	79,037)	10,000
Connecticut	80,232)	
<u>Middle Atlantic</u>		
New York	184,612	26,400
New Jersey	131,833	13,800
Pennsylvania	81,261	12,850
<u>East North Central</u>		
Ohio	72,139	9,840
Indiana	78,381	6,770
Illinois	127,803	17,150
Michigan	64,083	11,600
Wisconsin	72,716	9,250
<u>West North Central</u>		
Minnesota	101,370	17,960
Iowa	65,882	9,420
Missouri	137,547	22,000

State	Capitalization per Mile of Track	Operating Revenue per Mile of Track
North Dakota	30,152)	
South Dakota	36,607)	5,840
Nebraska	112,270	16,650
Kansas	60,644	5,880
<u>South Atlantic</u>		
Delaware	97,175)	
Maryland	135,575)	16,600
District of Columbia..	206,638)	
Virginia	129,178	12,200
West Virginia	82,875	10,950
North Carolina	89,221	11,200
South Carolina	59,083	5,900
Georgia	175,785	16,600
Florida	68,247	11,970
<u>East South Central</u>		
Kentucky	69,347	11,800
Tennessee	130,953	16,960
Alabama	87,115	13,400
Mississippi	77,316	7,620
<u>West South Central</u>		
Arkansas	103,135	16,100
Louisiana	195,856	18,620
Oklahoma	68,608	5,750
Texas	58,999	11,700

State	Capitalization per Mile of Track	Operating Revenue per Mile of Track
<u>Mountain</u>		
Montana	51,727	10,620
Colorado	92,981	12,450
New Mexico	48,679)	
Arizona	106,872)	
Idaho	88,834)	8,760
Wyoming	37,966)	
Nevada	104,676)	
Utah	55,800)	
<u>Pacific</u>		
Washington	122,145	12,840
Oregon	120,474	14,000
California	160,131	13,100

o Cal.

Net Capitalization
Thousands of
Dollars per
Mile of Track

140

120

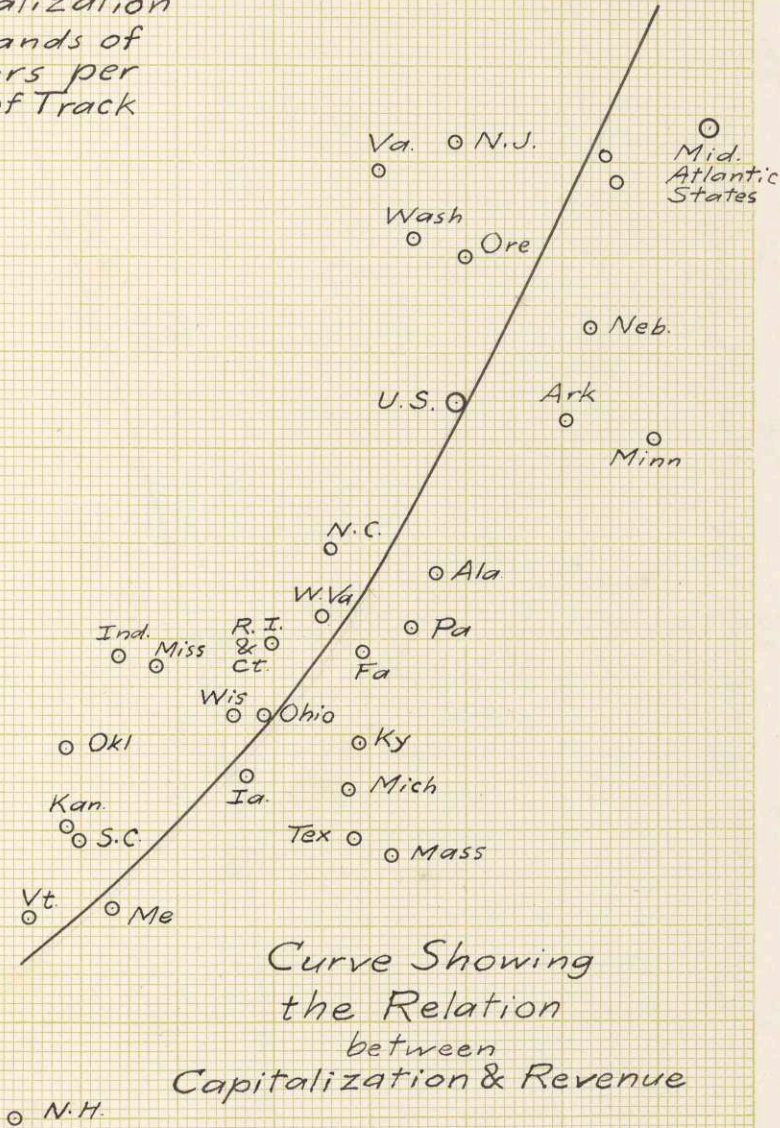
100

80

60

40

20



Curve Showing
the Relation
between
Capitalization & Revenue

Operating Revenue

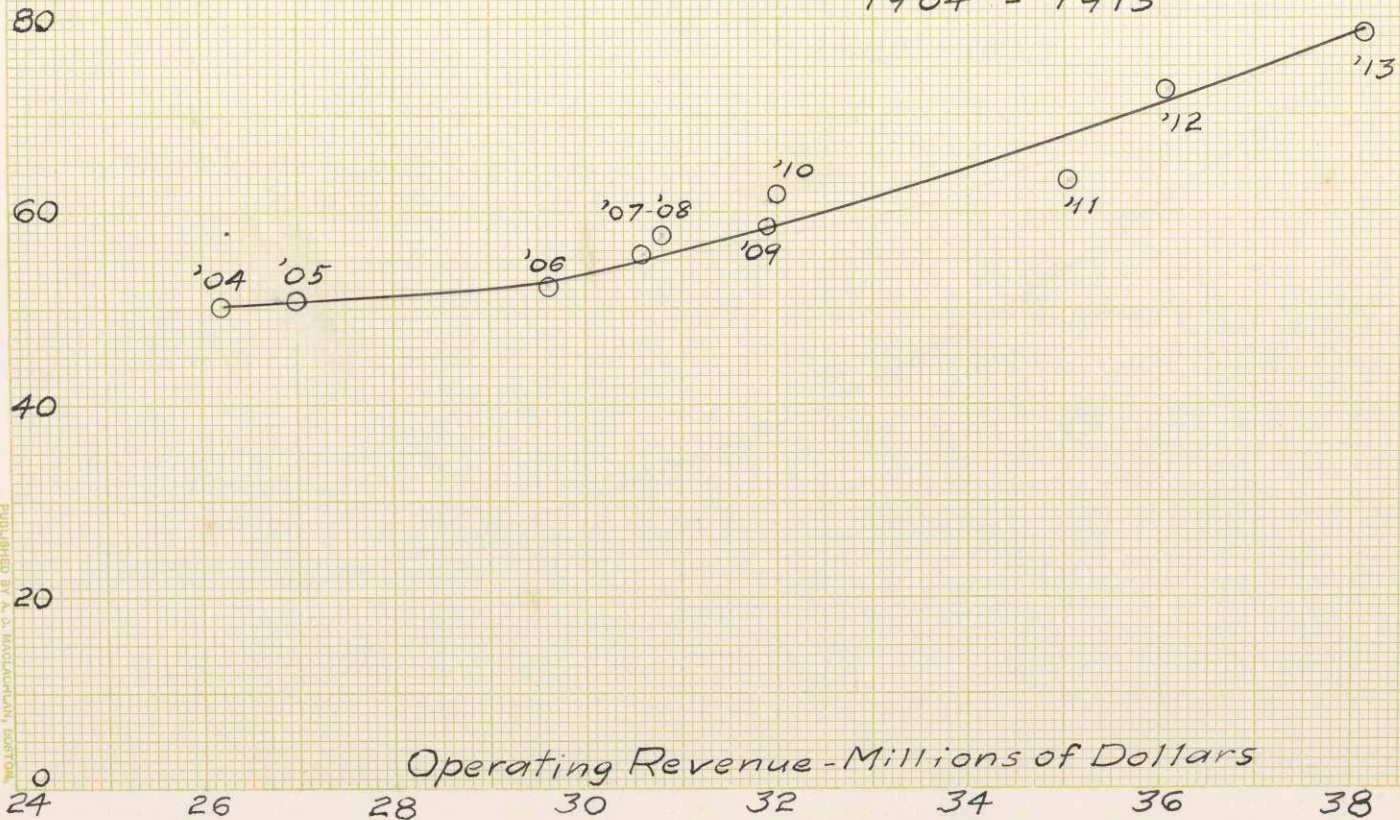
0 2 4 6 8 10 12 14 16 18 20

Thousands of Dollars per Mile of Track

PUBLISHED BY A. D. MACLAUGHLIN, BOSTON.

Thousands
of Dollars
Capitalization
per Mile of Track

Relation between Capitalization
and Revenue
in the State of Massachusetts
1904 - 1913



PUBLISHED BY A. D. HANCOCK, BOSTON

Net Capitalization
per Mile
Thousands of Dollars

BOSTON ELEVATED RAILWAY
Relative Increase
of Capitalization to Revenue
1888 - 1913

200
150
100
50
0

Gross Operating Revenue - Thousands of Dollars per Mi.

20

24

28

32

PUBLISHED BY THE UNIVERSITY OF CHICAGO PRESS

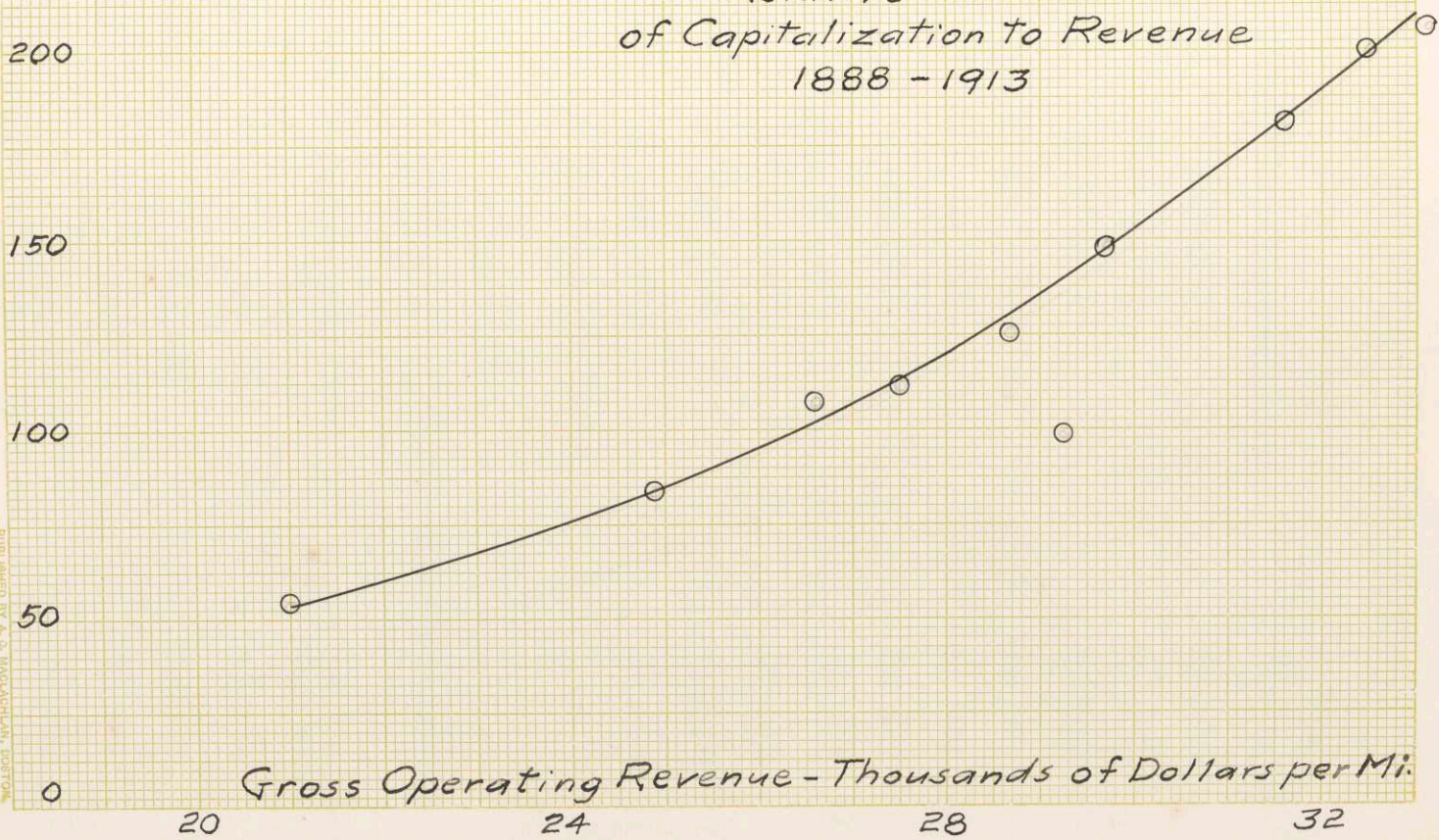


TABLE VII

CAPITALIZATION AND REVENUE IN MASSACHUSETTS

Year	Gross Operating Revenue	Net Capitalization Per Mile
1904	26,207,247	50,295
1905	27,041,291	50,772
1906	29,563,892	52,535
1907	30,557,862	55,624
1908	30,780,962	57,521
1909	31,956,007	58,337
1910*	24,032,236	61,673
1911	35,036,997	63,268
1912	36,080,237	67,679
1913	38,125,693	68,623

*Nine months ending June 30, 1910.

TABLE VIII

CAPITALIZATION AND REVENUE OF BOSTON ELEVATED RAILWAY

Year	Miles Track	Net Capitalization Per Mile	Operating Revenue Per Mile
1888	231	50,400	21,100
1893	268	84,000	24,960
1898	316	99,000	29,250
1901	408	107,300	26,600
1903	437	111,000	27,500
1905	445	128,000	28,650
1908	474	149,000	29,700
1910	485	181,000	31,600
1912	507	200,500	32,550
1913	511	206,000	33,200
1914	513	207,000	33,200

Four to six dollars of investment for each dollar of gross earnings form a relation that comes to be recognized as a very fair estimate. Mr. C. N. Duffy, former President of the American Electric Railway Association, gave that ratio in his report concerning a fair basis of rates.

Using this ratio as a standard, let us examine the ratios of gross capitalization to gross income throughout the states. Gross capitalization is the sum on which a return is to be taken out of the gross income from all sources, including railway operations as well as non-railway.

It is interesting to note that New England is the only section of the country where the ratio comes within the range given. In the Pacific states the ratio, \$11.47 per dollar gross, is almost double that of New England. The ratio of net capitalization to gross operating revenue is also shown for the geographical divisions, and in every case this ratio is somewhat smaller than the ratio of gross capitalization to gross income.

The range of figures means either the ratio of four to six dollars per dollar gross no longer holds true, or over-capitalization prevails among the electric railways. Perhaps both are true to some extent. The logarithmic trend of the capitalization revenue curves would intimate that the ratio of capitalization to revenue being the slope

of such a curve, is an ever-increasing quantity. On the other hand, figures as high as ten or more dollars per dollar gross surely smack of over-capitalization. Local conditions may explain in cases where all above six dollars is not "water," but in general all figures considerably larger than six to one should be regarded with suspicion.

TABLE IX

GROSS CAPITALIZATION AND GROSS INCOME

State and Division	Gross Capitalization			Net Capitalization per Dollar of Gross Operating Revenue
	Gross Income	Total	Per Dollar of Gross Income	
United States...	585,930,517	4,708,568,141	8.03	7.58
<u>Geographic Divisions:</u>				
New England	57,423,017	334,083,440	5.80	5.78
Middle Atlantic.	198,038,906	1,513,580,910	7.65	7.06
East North Cen..	139,260,473	1,123,665,109	8.07	7.65
West " "	45,179,223	314,339,675	6.96	6.60
South Atlantic .	41,368,967	402,016,673	9.72	9.22
East South Cen..	17,562,259	125,466,144	7.32	7.40
West " "	18,853,761	152,233,874	8.07	7.50
Mountain	11,950,736	94,219,186	7.88	7.31
Pacific	56,293,175	645,963,130	11.47	10.98
<u>New England:</u>				
Maine	3,593,617	35,144,207	9.78	
New Hampshire ..	1,250,391	6,485,400	5.20	
Vermont	631,241	5,661,658	9.00	
Massachusetts ..	37,490,704	174,520,275	4.65	
Rhode Island)		(33,158,700)		
)	14,457,064	()	7.80	
Connecticut)		(79,113,200)		

State and Division	Gross Income	Total	Per Dollar of Gross Income
<u>Middle Atlantic:...</u>			
New York	123,523,376	870,590,850	7.05
New Jersey	18,321,483	171,689,176	9.35
Pennsylvania	56,194,047	471,300,884	8.40
<u>East North Central:</u>			
Ohio	40,706,038	350,573,490	8.60
Indiana	16,142,075	191,331,922	11.80
Illinois	55,899,544	407,354,547	7.30
Michigan	17,864,692	102,107,230	5.70
Wisconsin	8,648,124	72,297,920	8.40
<u>West North Central:</u>			
Minnesota	9,685,258	55,899,200	5.80
Iowa	7,452,454	53,536,119	7.30
Missouri	21,115,228	139,246,050	6.60
North Dakota)		784,555	
South ")	238,587	790,350	6.60
Nebraska	3,618,337	35,223,276	9.70
Kansas	2,944,154	28,860,125	9.80

State and Division	Gross Income	Total	Per Dollar of Gross Income
<u>South Atlantic:</u>			
Delaware)		(10,553,200)	
Maryland)	17,318,667	(96,342,800)	9.90
Dist. of Columbia)		(53,812,268)	
Virginia	7,247,056	72,330,700	10.00
West Virginia	3,708,197	37,926,000	10.20
North Carolina	2,348,715	23,923,300	10.20
South "	1,345,450	13,049,305	9.60
Georgia	7,421,747	82,930,000	11.20
Florida	1,969,315	11,149,100	5.70
<u>East South Central:</u>			
Kentucky	6,155,248	39,262,150	6.40
Tennessee	6,151,953	49,579,000	8.05
Alabama	4,344,668	29,999,500	6.90
Mississippi	103,900	9,625,494	9.30
<u>East South Central:</u>			
Arkansas	1,891,949	12,665,896	6.70
Louisiana	6,998,131	77,376,064	11.00
Oklahoma	1,449,278	17,995,050	12.40
Texas	8,514,403	44,196,904	5.20

State and Division	Gross Income	Total	Per Dollar of Gross Income
<u>Mountain:</u>			
Montana	1,065,597	6,146,752	5.80
Colorado	6,630,480	56,183,680	8.50
New Mexico)	360,288	(516,000)	16.10
Arizona)		(5,279,500)	
Idaho)	3,894,371	(9,274,609)	6.96
Wyoming)		(895,000)	
Nevada)		(1,180,695)	
Utah)		(14,742,950)	
<u>Pacific:</u>			
Washington	13,590,933	136,246,008	10.00
Oregon	7,856,471	69,436,576	8.70
California	34,845,771	441,280,546	12.70

N.B. In the first part of Table IX, the ratios of net capitalization to operating revenue, both being supposed to be strictly chargeable to track, are shown together with those of gross capitalization to gross income. In every case the former are somewhat smaller, but not materially so. Presumably, the return on the non-railway investments is less compared with the railway investments proper.

CLASSES OF SECURITIES.

In a correct estimate of capitalization it is of fundamental importance to clearly indicate the interest or dividend rate attached to railway securities. If all railroad companies had the same proportion of each kind and class of securities outstanding with correspondingly uniform interest and dividend rates, the measurement of relative capitalization on the basis of the par value would be a simple matter. The absolute diversity in this respect, as shown in the tables XI and XIa, renders any study or comparison of capitalization based on general compilations only approximate to the actual state of affairs.

An example or two will make this clear. One road has \$60,000,000 of irredeemable preferred stock outstanding on which it pays the full dividend of five per cent. Another road has \$75,000,000 of preferred stock, on which, however, it is required only to pay four per cent. Though the second company has the larger capitalization, it is not any worse off than the first in the amount of dividend it has to pay.

Again, a company which issues five per cent thirty year bonds at par for \$50,000,000 cash would do better if it could issue for the same cash sum \$55,000,000 four per cent bonds of the same maturity. For in the former case

the annual interest is \$2,500,000, while in the latter it is less than \$2,367,000, including discount amortization.

From an investment standpoint the relative proportions of the various classes of securities is of far greater import than aggregate amount of capitalization. When a road is earning a good return, it is largely a question of financial policy whether bonds or whether capital stock shall be sold to acquire additional capital. It is interesting to compare the amounts of outstanding stocks and bonds for some of the big metropolitan lines in the year 1912.

Name of Company	Stocks	Bonds
Interboro Rapid Transit	35,000,000	33,959,000
Brooklyn " "	45,653,826	83,362,540
Philadelphia " "	29,977,120	21,000,000
New York Railways	17,500,000	56,578,345
Chicago "	100,000	83,276,611
Boston Elevated Railway	19,950,000	18,300,000
Cleveland Railway	15,074,600	10,153,340
United Railroads of San Francisco	42,948,600	40,000,000
Twin City Rapid Transit.....	23,100,000	19,503,000
Detroit United Railway	12,500,000	24,950,000

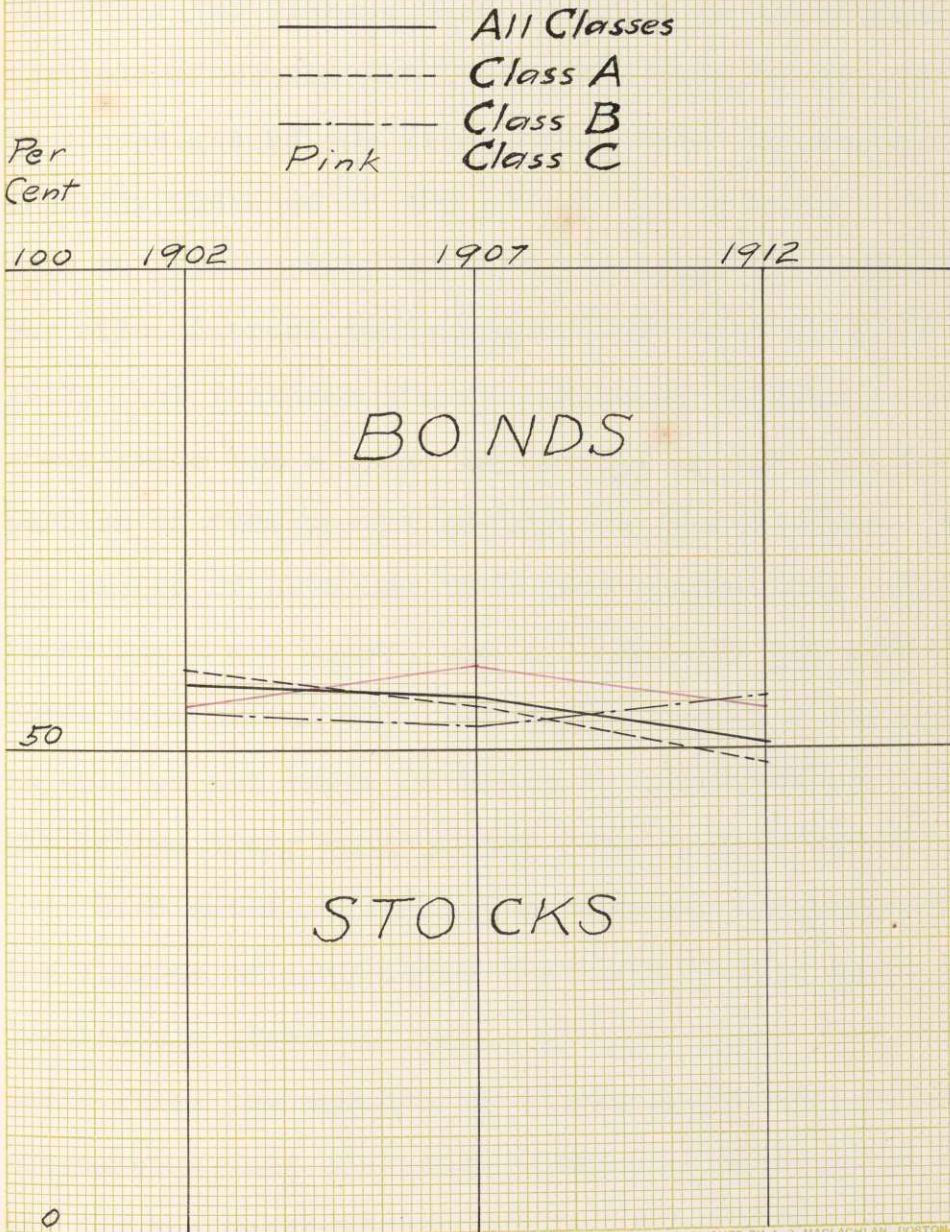
Apparently the bonds play an important part in these roads of the greatest traffic density. They vary from less

than half of the total capitalization to an unusual pre-
 dominance in the case of Chicago Railways. It seems to
 be the general tendency that the greater the revenue of
 a road becomes the more bonds are sold in relation to
 its total capitalization. This tendency is apparent from
 the following comparison of the three classes of railways.

1912	Capital Stock		Bonds	
	Amount	Per Cent	Amount	Per Cent
Class A	1,575,441,509	48.4	1,676,468,192	51.6
Class B	459,944,577	55.7	365,861,699	44.3
Class C	343,960,227	54.5	286,891,937	45.5
1907				
Class A	1,356,564,140	54.6	1,087,249,675	45.4
Class B	353,782,282	52.5	318,299,500	47.5
Class C	387,362,434	58.8	271,514,065	41.2
1902				
Class A	872,603,911	58.5	620,792,432	41.5
Class B	204,256,078	54.0	173,800,163	46.0
Class C	238,712,971	54.7	198,116,544	45.3

It should be remembered that Class A includes the
 companies operating in urban districts of highest traffic
 density with operating revenue of over a million dollars

Diagram Showing the Increasing Proportion of Bonds



per annum. Class B has revenues from \$250,000 to \$1,000,000, and Class C not over \$250,000. It is in Class A that the increase in bonds was the most steady and marked, as clearly shown in the comparative diagram. The other two classes were unsteady in the change of proportions of stocks and bonds, but were so overshadowed by the weight of the first class that the average was a steady increase of the proportion of bonds. It may be said in passing that while the average net capitalization per mile of track increased 4.3 per cent from 1907 to 1912, that increase was due entirely to funded debt. The steam roads had similar experience in the increasing proportion of funded debt during the recent years. Perhaps the panics of 1903 and 1907 made people more careful in investing their money, and consequently for safety's sake bonds were preferred. The smaller roads could not borrow as well as the roads of Class A, and therefore had to capitalize their enterprises largely with capital stocks.

More detailed statistics showing the percentage of the classes of securities that make up the gross capitalization are given on tables (X) and (XI). The first table gives the amounts of common and preferred stocks outstanding, and of funded indebtedness or bonds outstanding for the geographical divisions. The relative interest burden on each is also shown. The other table gives the percentages for the different states, and in addition,

gives the amounts of floating indebtedness and real estate mortgage. The last represent to a large degree funds used for carrying on the business of the companies as well as the subscribed capital stocks and bonds, and in a broad sense they constitute invested capital on which profits are realized in the form of interest. In fact, they are in many cases used for betterments and equipment, and should, therefore, be considered as a part of capitalization, but it is impossible to determine to what extent they are so appropriated. For the sake of simplicity, floating debts are not considered a part of capitalization, but they may form a considerable factor in certain districts, notably in Massachusetts. In general, however, they are small compared with the funded indebtedness. The Interstate Commerce Commission used to include the current liabilities in capitalization until the Association of Railroad accountants petitioned it to consider it in a separate item.

Some idea of the uneven representation of the classes of securities and variable character of the returns may be gained from the graphic representation of the proportions in the divisions, and the Tables X and XI. It happened that the stocks and bonds average up for the United States almost exactly "fifty-fifty." The New England States have the largest proportion of stocks, and especially of the common stocks, while East South Central

States sold more bonds. The West South Central division has the largest proportion of any in preferred stocks, which amounts to fifteen per cent.

The rate of return is the most fixed on the funded and floating debts, and the most varied on the preferred stocks. The former lies between four and five per cent. The upper limit is found in New England, where the funded debt is a comparatively small part of the total capitalization and floating debt is handled in larger amounts than elsewhere. The Pacific States declare the smallest dividends of all, doubtless in a large measure on account of high capitalization per mile.

TABLE X.

CLASSES OF SECURITIES AND THEIR RETURNS

	Common Stocks	%	Pr'fd St'ks	%	Bonds	%
U. S.	1,970,385,003	41.8	408,961,310	8.8	2,329,221,828	49.4
New Eng. ..	180,653,350	54.1	23,760,250	7.1	129,639,840	38.8
Mid. Atl. . .	636,148,840	42.1	75,849,537	5.0	801,582,533	52.9
E.N.Cen. . .	424,192,308	37.7	110,111,403	9.9	589,361,398	52.4
W.N.Cen. . .	120,920,545	38.4	38,326,975	12.2	155,092,155	49.4
S. Atl. . . .	151,100,605	37.5	45,466,900	11.3	205,449,168	51.2
E.S.Cen. . .	43,966,704	34.1	13,202,860	10.3	71,296,580	55.6
W.S.Cen. . .	61,665,778	40.4	24,866,427	16.3	65,691,669	43.3
Mountain . .	40,134,552	42.6	8,070,175	8.6	46,014,459	48.8
Pacific . . .	311,592,321	48.2	69,286,783	10.7	265,094,026	41.1

RETURNS ON THE SECURITIES

	Dividends				Interest on Funded and floating debt and mortgages.	
	Common St'k	%	Pref'd St'k	%		%
U. S.	58,759,715	2.98	12,232,503	2.99	113,259,470	4.32
New Eng. . .	6,781,098	3.76	827,231	3.48	6,478,134	5.00
Mid. Atl. . .	24,881,763	3.91	2,826,001	3.73	38,941,696	4.10
E.N.Cen. . .	10,930,374	2.58	3,644,043	3.31	28,151,023	4.52
W.N.Cen. . .	2,602,728	2.16	734,037	1.92	8,195,624	4.65
S. Atl. . . .	3,855,777	2.55	1,619,594	3.56	8,864,523	4.05
E.S.Cen. . .	1,783,573	4.06	676,666	5.12	3,440,406	4.58
W.S.Cen. . .	1,793,975	2.91	845,445	3.40	3,741,908	4.90
Mountain . .	1,331,000	3.32	69,285	0.86	2,625,980	4.78
Pacific . . .	4,799,427	1.54	990,193	1.43	12,820,176	4.18

Proportion of Constituents of Gross Capitalization

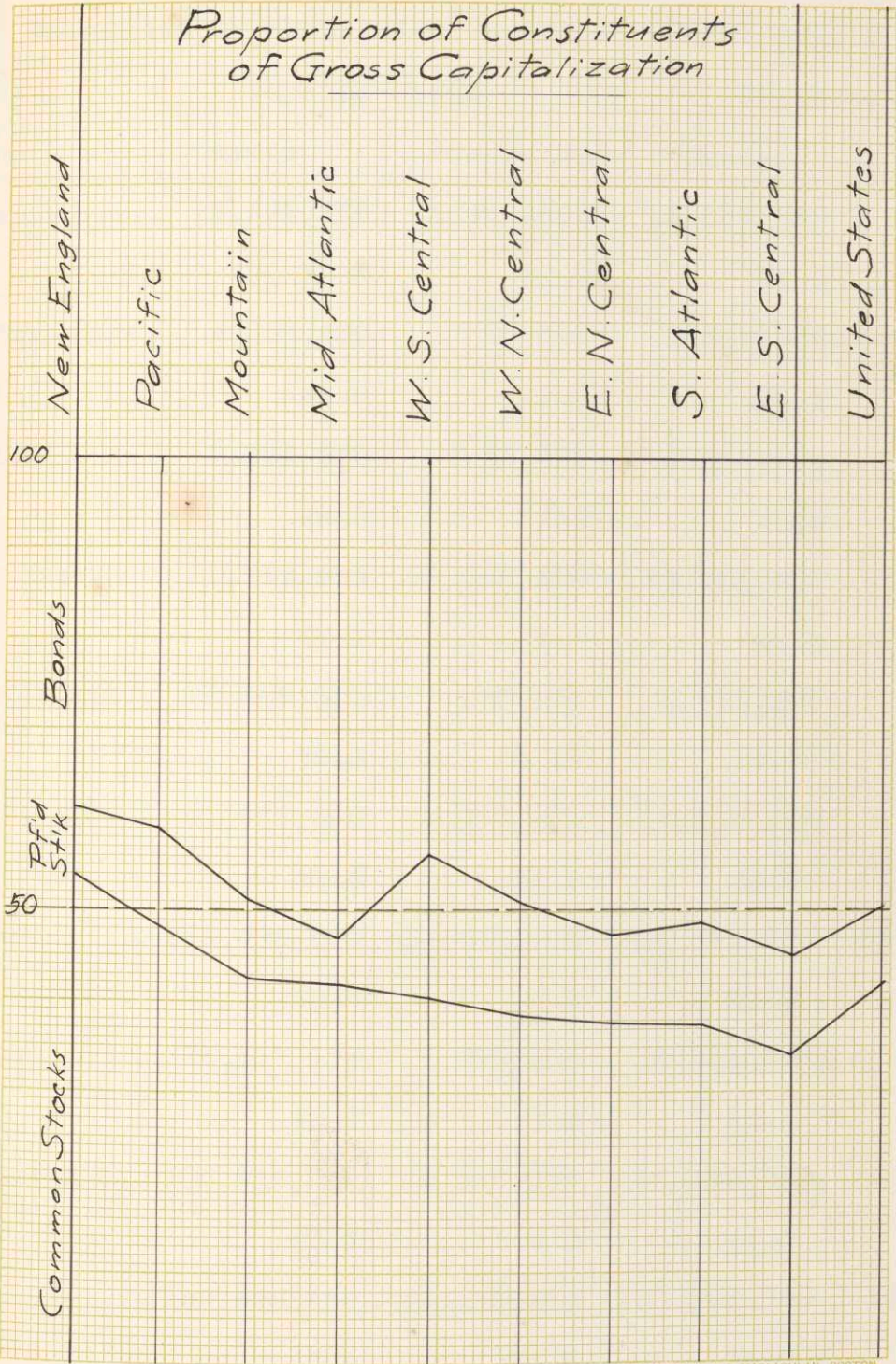


TABLE XI a

PROPORTION OF SECURITIES IN THE DIFFERENT STATES

State	Capital Stock		Indebtedness	
	Common	Preferred	Funded	Floating & Mortgages
Maine.....	11,591,825	4,450,000	19,102,382	61,998
%	33.0	12.7	54.3	
New Hampshire..	4,093,400	70,000	2,322,000	222,608
	63.0	1.1	35.9	
Vermont	2,824,350	23,750	2,813,558	259,289
	49.8	0.4	49.8	
Massachusetts..	83,732,975	10,058,600	80,728,700	15,532,123
	48.0	5.7	46.3	
Rhode Island..	26,485,500	150,000	6,523,200)	
	79.8	0.45	19.75)	
Connecticut...	51,955,300	9,007,900	18,150,000)	2,419,812
	65.6	11.5	22.9)	
New York	354,075,580	34,943,500	481,571,770	110,443,630
	40.7	4.0	55.3	
New Jersey ...	75,157,176	1,600,000	94,932,000	6,338,393
	43.7	0.9	55.4	
Pennsylvania..	206,916,084	39,306,037	225,078,763	32,888,153
	43.7	8.3	48.0	
Ohio	162,629,150	49,138,300	138,806,040	13,052,133
	46.4	14.0	39.6	
Indiana	71,742,225	30,203,910	89,385,787	5,334,338
	37.6	15.8	46.6	

State	Capital Stock		Indebtedness	
	Common	Preferred	Funded	Floating & Mortgages
Illinois	129,583,927	21,150,193	256,620,427	10,697,213
	% 31.8	5.2	63.0	
Michigan	37,726,506	4,269,000	60,111,724	3,299,366
	37.0	4.2	58.8	
Wisconsin	22,510,500	5,350,000	44,437,420	1,612,511
	31.1	7.4	61.5	
Minnesota	26,674,700	5,644,500	23,580,000	451,962
	47.7	10.0	42.3	
Iowa	23,851,244	4,975,975	24,708,900	5,086,335
	44.6	9.3	46.1	
Missouri	40,992,150	18,306,700	79,947,200	14,937,965
	29.4	13.1	57.5	
N. Dakota	470,000		314,555)	
	60.0		40.0)	
			)	60,000
S. Dakota	490,350	100,000	200,000)	
	62.0	12.7	25.3)	
Nebraska	13,871,376	7,712,900	13,639,000	108,993
	39.4	21.9	38.7	
Kansas	14,570,725	1,586,900	12,702,500	203,226
	50.4	5.5	44.1	
Delaware	8,071,000	600,000	1,882,200)	
	76.5	5.7	17.8)	
			)	2,962,958
Maryland	23,662,000	1,654,000	71,026,800)	
	24.6	1.7	73.7)	
)	
Dist. of Col..	21,064,800	8,500,000	24,247,468)	
	39.2	15.8	45.0)	

State	Capital Stock		Indebtedness	
	Common	Preferred	Funded	Floating & Mortgages
Virginia	25,530,600	8,675,000	38,125,100	2,913,272
%	35.3	12.0	52.7	
W. Virginia ..	16,140,300	3,480,800	18,304,900	1,273,224
	42.5	9.2	48.3	
N. Carolina ..	13,482,200	2,267,100	8,174,000	1,725,194
	56.4	9.5	34.1	
S. Carolina ..	7,332,905	1,640,000	4,076,400	1,987,964
	56.1	12.5	31.4	
Georgia	31,181,200	17,500,000	34,248,800	1,645,158
	37.6	21.1	41.3	
Florida	4,635,600	1,150,000	5,363,500	783,794
	41.6	10.3	48.1	
Kentucky	16,341,220	2,523,810	20,397,120	1,171,809
	41.6	6.4	52.0	
Tennessee	13,701,000	7,000,000	28,878,000	1,084,069
	27.6	14.1	58.3	
Alabama	9,482,000	3,515,000	17,002,500	1,095,608
	31.6	11.7	56.7	
Mississippi ..	4,442,484	164,050	5,018,960	504,582
	46.1	1.7	52.2	
Arkansas	3,642,893	2,470,227	6,552,736	317,761
	28.7	19.5	51.8	
Louisiana	30,016,514	15,436,800	31,922,750	2,529,177
	38.8	20.0	41.2	

State	Capital Stock		Indebtedness	
	Common	Preferred	Funded	Floating & Mortgages
Oklahoma	8,299,650	2,544,400	7,151,000	1,322,711
%	46.1	14.1	39.8	
Texas	19,696,721	4,425,000	20,065,183	6,366,901
	44.5	10.0	45.5	
Montana	2,942,532	690,000	2,514,220	90,022
	47.8	11.3	40.9	
Colorado	23,679,550	1,224,000	31,280,130	2,286,520
	42.2	2.2	55.6	
New Mexico ...	325,000		191,000)	
	63.0		37.0)	
Arizona	3,544,700	320,000	1,414,800)	
	67.2	6.0	26.8)	
Idaho	4,661,800	1,473,000	3,139,809)	
	50.2	15.9	33.9)	
Wyoming	475,000		420,000)	6,515,269
	53.0		47.0)	
Nevada	1,044,695		136,000)	
	88.5		11.5)	
Utah	3,461,275	4,363,175	6,918,500)	
	23.4	29.6	47.0)	
Washington ...	59,829,975	19,489,533	56,926,500	12,085,442
	43.9	14.3	41.8	
Oregon	24,872,800	354,000	43,209,776	10,320,283
	36.4	0.5	63.1	
California ...	226,879,546	49,443,250	164,957,750	20,266,276
	51.2	11.4	37.4	

TABLE XI b

RETURNS ON SECURITIES IN DIFFERENT STATES

State	Dividends				Interest on Funded & Floating Debts	
	Common	%	Preferred	%	Amount	%
Maine	171,359	1.48	208,498	4.68	921,407	4.80
New Hampshire .	91,755	2.24	.....	.....	111,618	4.38
Vermont	82,286	2.92	861	3.63	150,315	4.9
Massachusetts .	3,501,259	4.18	168,756	1.68	4,115,136	4.27
Rhode Island .	1,057,565	3.99	100,000	6.66		
Connecticut ..	1,876,874	3.61	349,116	3.87	1,149,658	4.7
New York	17,445,609	4.93	1,249,381	3.67	24,352,988	4.12
New Jersey ...	1,818,375	2.42	95,487	5.96	4,569,033	4.52
Pennsylvania ..	5,617,779	2.72	1,451,143	3.69	10,019,675	3.9
Ohio	3,720,039	2.19	1,292,557	2.63	6,897,178	4.54
Indiana	667,937	0.93	761,415	2.52	4,281,053	4.53
Illinois	4,516,418	3.49	1,080,490	5.12	12,280,523	4.60
Michigan	862,500	2.29	223,080	5.23	2,933,972	4.62
Wisconsin	1,163,480	5.20	286,500	5.36	1,758,297	3.93
Minnesota	1,458,500	4.47	210,000	3.73	1,178,850	4.73
Iowa	565,552	2.37	138,806	2.79	1,053,700	3.54
Missouri	227,000	0.55	54,600	0.30	4,568,005	4.82
North Dakota .	28,170	6.0		)	30,805	5.23
South Dakota .)		
Nebraska	286,756	2.06	327,082	4.24	706,956	5.14
Kansas	36,750	0.25	3,549	0.22	657,408	5.10

State	Dividends				Interest on Funded & Float- ing Debts	
	Common	%	Preferred	%	Amount	%
Delaware	144,600	1.79	30,000	6.0	4,111,157	2.51
Maryland	502,475	2.12	88,275	5.34		
Dist. of Col..	980,000	4.65	425,000	5.00		
Virginia	522,228	2.05	398,960	4.60		
West Virginia..	373,425	2.31	120,748	3.47	814,766	4.16
North Carolina	92,217	0.68	115,784	5.10	405,278	4.08
South Carolina	113,725	1.55	30,000	1.83	222,820	3.70
Georgia	888,357	2.85	354,807	2.03	1,282,834	3.57
Florida	238,750	5.16	56,019	4.87	285,815	4.65
Kentucky	1,112,935	6.82	125,000	4.97	924,293	4.28
Tennessee	328,888	2.39	341,666	4.88	1,418,102	4.74
Alabama	341,750	3.60	210,000	5.97	834,480	4.67
Mississippi ..					263,531	4.77
Arkansas	150,000	4.12	139,195	5.63	374,635	5.45
Louisiana	1,024,495	3.42	540,250	3.50	1,574,893	4.58
Oklahoma	25,216	3.04			422,791	4.99
Texas	594,265	3.01	166,000	3.74	1,369,589	5.19
Montana			30,000	4.35	116,650	4.48
Colorado	1,300,000	5.48	39,285	3.20	1,618,029	4.82

State	Dividends				Interest on Funded & Floating Debts	
	Common	%	Preferred	%	Amount	%
New Mexico ...)	
Arizona	31,000	0.85)	
Idaho)	
Wyoming .....					)	891,301 4.76
Nevada)	
Utah	3,000	0.10)	
Washington ...	1,904,321	3.18	428,193	2.20	2,976,182	4.31
Oregon	2,322,260	9.34	12,000	3.40	2,127,132	3.98
California ...	572,846	0.25	550,000	1.11	7,716,862	4.16

CAPITALIZATION AND STATE.

Under this heading such factors affecting the capitalization as come through the body politic will be considered. These constitute a group apart from the questions already touched upon, which are directly connected with the track, or which concern its operations. In this group will be included legislation, regulation and taxation.

State laws differ widely in their dealings with corporations. Among those which exercise a restraining influence towards excessive capitalization of public service corporations are some such laws as require:

1. A certain per cent of the capital stocks must be subscribed or paid in before incorporation.
2. A tax on capitalization and annual franchise taxes.
3. Full payment of issued stocks. The trouble with these laws is that they are often not enforced, or else they may be surmounted somehow or other in case a corporation is bent on over-capitalizing its assets. Many enterprises are chartered in states they are not native of, simply to take advantage of better accommodating laws. In order to avoid the federal corporation tax, some enterprises have organized as unincorporated associations under the Massachusetts law. Large amounts of securities

have been made tax exempt by skilful manipulations of certain state laws.

Perhaps it was due to the inefficacy of legislation to cope with the growing problem presented by the public utilities that regulation came into being through commissions vested with certain powers by the state. When the Massachusetts Railroad Commission was created in 1869, it was to serve only in an advisory capacity. It did its work so thoroughly, fairly and satisfactorily, that it was given more and more power, until it has today a most effective control over capitalization. As a result, public service commissions sprang up in all parts of the country, creating an epoch in the industrial history of the United States.

Any state regulations of corporation finance rest primarily on one or more of three general purposes:

1. To protect creditors.
2. To protect prospective shareholders.
3. To protect the general public from having to pay an excessive return on capital invested in the business.

The public often went to the extreme in its demands on the utilities, once its voice could be heard, so that the commissions in a spirit of fair play towards the utilities have come to recognize a fourth purpose, namely,

4. To protect the public utilities from unjust de-

mands from the public.

At present it is generally conceded that while a utility is giving satisfactory service, it is entitled to an adequate return, one that is more than pure interest. It is a truism of economics that any given return from capital represents two things: one, what is called true interest, or the return due to capital as such; the other, the premium for the assumption of the risk in employing the capital in any particular direction. Commissions no less than others differ in their opinions as to how much should be allowed for the premium over and above the true interest. In other words, what constitutes an adequate rate of return on capitalization? In order to determine what is an adequate return it is necessary to determine first what is fair capitalization. As the commissions base the latter on the value of the property, their jurisdiction necessarily includes valuation of property. The method of valuation used by one state commission is different from that used by another. In Massachusetts, "the original cost of construction, the amount and market value of its bonds, the present as compared with the original cost of construction, the probable capacity of the company under the rates prescribed by the statute, and the sum required to meet operating expenses are all matters for consideration and to be given such weight as may be just and fair in each case." No

value whatever is placed on non-physical property, and no utility is allowed to increase its capitalization beyond the value of the physical property. In New York, valuation is based on the cost of reproduction plus depreciation, and franchise and other intangible assets are included in so far as they were actually paid to the state. In Wisconsin the commission must value all the property of every public utility on three bases:

- (1) Original cost.
- (2) Cost of reconstruction.
- (3) The present value.

Which of these bases the commission may use depends on the special circumstances of each case. In all cases the franchise is valued at its actual cost alone, and no other intangible assets are considered. The commission also includes the "going cost," or the deficit from operation during the development period, which is admittedly as necessary and fair a cost as the cost of plant construction.

If the regulation of the utilities in all the states is co-ordinated and put on a uniform basis, the discrepancy in capitalization statistics on the per mile basis would be materially lessened, and until that is done, as it probably will be, inasmuch as one has already begun to hear about federal valuation of public utilities, any statistical study of comparative capitalization in

different states is deprived of much of its scientific importance.

In regard to the question of taxation, it is worthy of note that in New England where the taxation on capital stock is heaviest one finds the lowest capitalization per mile of any state. The following table compares the amounts of each kind of taxation for the geographical divisions:

TABLE XII.

DISTRIBUTION OF TAXES IN 1912.

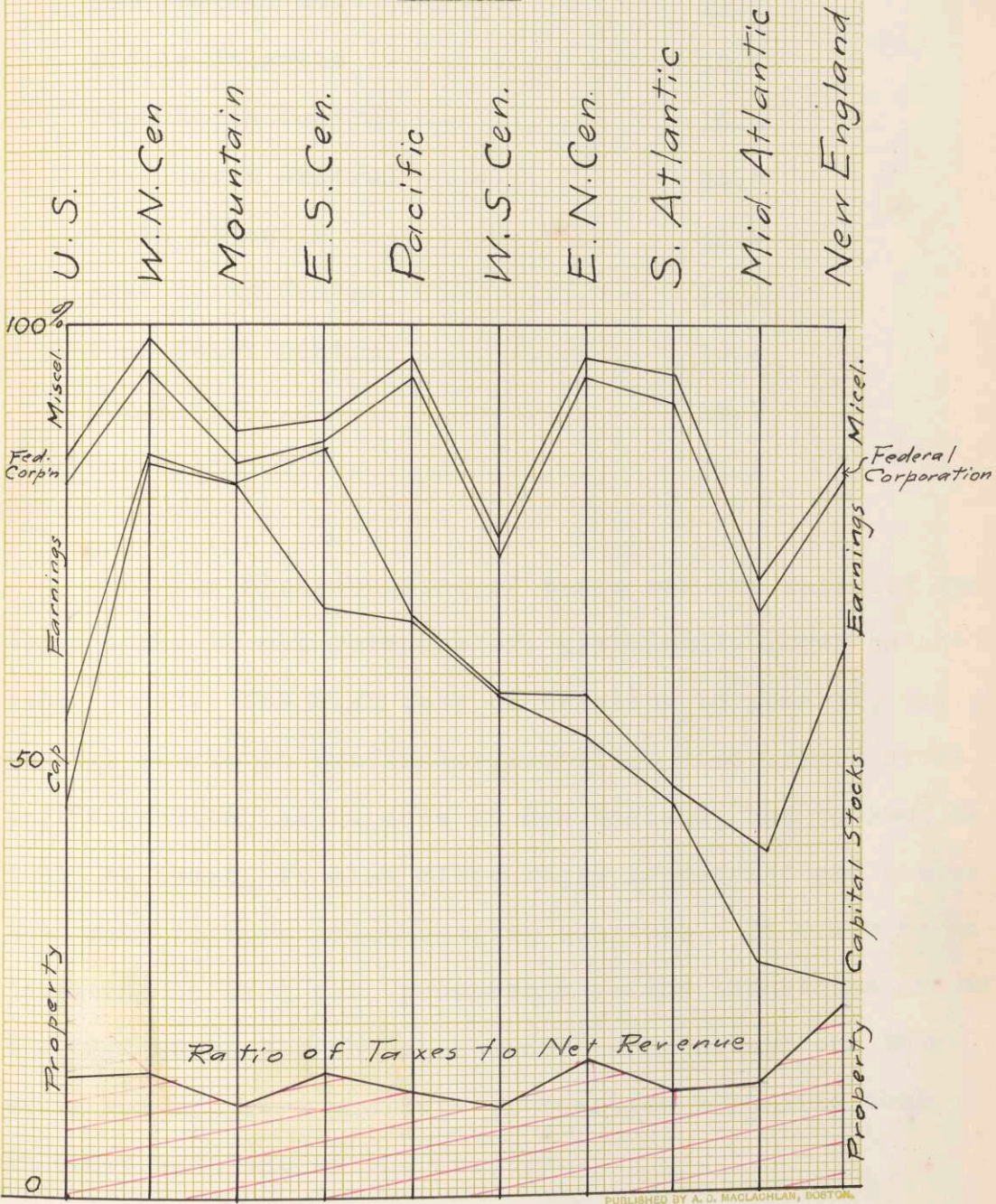
Division	Total	Property	Cap. Stock	Earnings	Federal Corpora- tion	Miscel.
New Eng- land...	4,237,429	1,006,464	1,658,536	827,761	95,169	649,499
%	100	23.8	39.1	19.5	2.2	15.3
Middle At- lantic..	11,249,018	2,985,787	1,503,794	3,028,532	424,187	3,306,718
	100	26.5	13.4	26.9	3.8	29.4
E.N.Cen- tral..	9,211,636	4,864,084	424,154	3,385,171	211,730	326,497
	100	52.8	4.6	36.7	2.3	3.5
W.N.Cen- tral..	2,490,045	2,093,401	26,715	243,264	82,924	43,741
	100	84.1	1.1	9.8	3.3	1.8
S.At- lantic	2,353,998	1,049,168	63,789	1,036,975	72,285	131,781
	100	44.6	2.7	44.1	3.1	5.6
E.S.Cen- tral..	1,105,753	750,054	201,313	11,395	25,008	117,983
	100	67.8	18.2	1.0	2.3	10.7
W.S.Cen- tral..	883,447	506,683	2,995	136,926	20,750	216,093
	100	57.4	0.3	15.5	2.4	24.5
Mountain	589,860	482,068	951	13,440	20,112	73,289
	100	81.7	0.1	2.3	3.5	12.4
Pacific..	2,906,779	1,920,530	16,899	803,328	64,736	101,286
	100	66.1	0.6	27.5	2.2	3.5
United States	35,027,965	15,658,239	3,899,146	9,486,792	1,016,901	4,966,887
	100	44.7	11.1	27.1	2.9	14.2

In the New England and Middle Atlantic divisions taxes on real and personal property constituted but one-fourth, approximately, of the total taxes, while miscellaneous taxes formed the greatest item for the Middle Atlantic division, principally on account of the special franchise taxes of the New York City lines.

In the South Atlantic division the tax on earnings is but a little less in the aggregate than the tax on real and personal property, this being due to conditions in Maryland and the District of Columbia. In the East North Central division tax on earnings constitutes a little more than a third of the total taxes, on account of conditions in Ohio and Illinois. In the latter state, out of a total of \$2,555,556 reported as tax on earnings, \$2,529,992 or 98.8 per cent is the share of net receipts received by the city of Chicago from its traction systems. The large ratio for the Pacific division is due to conditions in California, where the tax on earnings formed 48.2 per cent of all taxes.

The railways in New England not only pay the highest rate of taxes on capital stocks, but also suffer the aggregate amount of taxes to consume the largest portion of the net revenue, or gross income less operating expenses. In fact it almost doubles the average of all divisions.

Per Cent Distribution of Taxes and its Relation to Net Revenue



Division	Ratio of Taxes to Net Revenue
United States	13.8 %
New England	21.1
Middle Atlantic	12.6
East North Central	15.2
West North Central	14.0
South Atlantic	11.9
East South Central	14.4
West South Central	10.4
Mountain	10.7
Pacific	12.2

Both the distributions of taxes and the ratio of the total taxes to net revenues are graphically shown on another sheet. The high rate of taxation in general, and on capital stocks in particular, doubtless discourages overcapitalization, as it does in New England, but to some extent, at least, it also discourages industries and scares them away to more accommodating quarters. It would be interesting to find out, prosperous as the industries are in New England on the whole, how much more prosperous they would become, were the rate of taxation more like that in other sections of the country.

CONCLUSION.

In view of the many delusive elements in all capitalization statistics of today, and the limited amount of time that was available for their digest, any deductions that may be drawn from the mass of data are necessarily of the most general sort.

To summarize, there are apparently four factors that together determine the magnitude of capitalization:

1. Cost of the Road. The cost of construction, equipment and real estate, of course, forms the basis of capitalization, and is the most important factor of all. But in many cases, instead of conforming capitalization to the cost, the nominal amount of cost is made to conform to the capitalization. Moreover, as stated before, it is often difficult to separate the tangible and the intangible in the value of the property. In general, corporations over-estimate the cost of their properties when they wish to "water the stock" so as to hide from the public excessive returns on their capital. On the other hand, they under-estimate the cost when their properties are assessed for taxation. As the rate of taxation is low, as compared with the rate of dividend, we should expect on the whole properties over rather than under-estimated.

In this connection it might be mentioned that a

Wisconsin Street Railway had occasion to felicitate itself on account of the low value at which the state had just assessed its road. A little later a Public Service Commission was created to investigate the road in order to determine the proper rate of fare. Thereupon the low assessed valuation of the road became a bed of thorns instead of one of roses.

2. Operating Revenue. When a road becomes a going concern we find that the rate of return begins to exert some influence on capitalization. The latter increases even in a greater ratio than does the revenue, as the logarithmic trend of the revenue capitalization curves seem to indicate. Accordingly one should expect to find large capitalization per mile in a road that receives large operating revenues, like most of the railways in the big cities.

3. Classes of Securities. The proportion of the classes of securities and the burden of interest on each play an important part in fixing capitalization per mile as well as gross. One road may have a much higher capitalization per mile than another, and yet shoulder an equal or even smaller burden of interest. When more capital can be raised by selling one kind of securities than another and the stipulated interest burden is same in both cases, naturally the capitalization would be increased more in one case than in the other.

4. State and Taxation. We have seen that certain laws have great influence in limiting capitalization, and certain taxes, notably taxes on capital stocks, materially discourage over-capitalization. More and more power has been vested in the public service commissions of the various states, whose restraining hand is ever ready to put on over-capitalization. Perhaps not in the far distant future all public service corporations will have their properties appraised by the state or federal commissions, and capitalization will be placed uniformly and strictly on a cost basis throughout the country. Then the electric railways in common with other public utilities would be squeezed of all the "water" that there is in their stocks.

So much for the principal factors of capitalization. There are still a hundred and one other conditions, local or otherwise, that affect capitalization through these factors, principally cost and revenue. For instance, in primary power equipment the Pacific States use a great deal of water power, about two-thirds of the aggregate horse power output, as compared with one-tenth in New England. Since water power plant and equipment have high first cost, the capitalization in these states is thereby inflated by the large investment in construction and equipment. But for the offset in comparatively low operating expenses, the interest burden would be excessive.

In the Southern States labor is less efficient than in the North, so that the cost of construction is higher and hence also the capitalization. In the mountainous sections the cost of construction is high on account of the engineering and transportation difficulties, and in densely populated districts the cost of real estate becomes a big item. In either case the result is high capitalization per mile.

Then certain features of traffic may directly or indirectly affect capitalization. The number of car miles per year per car indicates whether there is a liberal provision of all kinds of cars or not.

TABLE XIII.

CAR MILES PER CAR AND PER MILE

Division	No. of Revenue Cars	Revenue Car Miles Per Year		
		Total	Per Revenue Car	Per Mile Track
United States	83,956	1,921,620,074	22,900	46,800
New England...	11,958	191,451,066	16,000	36,200
Middle Atlantic...	27,456	663,588,817	24,200	66,000
East North Central ...	19,042	474,239,256	24,900	40,150
West North Central....	5,804	152,346,875	26,300	49,200
South Atlantic...	6,510	124,591,004	19,150	42,100
East South Central ...	2,401	58,056,424	24,100	45,150
West South Central ...	2,275	61,616,556	27,100	47,800
Mountain	1,304	30,149,835	23,100	29,950
Pacific	7,306	165,580,241	22,700	39,500

The 16,000 car miles per car per year, which is considerably lower than the average, reflect credit on New England roads, which invested more money on cars than those in other sections, and yet showed the smallest capitalization per mile.

The number of car miles per year per mile of track shows whether the tracks are used to good advantage, or much of them lie idle. If the former, the operating revenue must be a handsome figure per mile and affect capitalization accordingly. If the latter, as the 29,950 car miles per mile of the Rocky Mountain Division indicate, the traffic is slow and the operating revenue small, and one should expect to find small capitalization per mile, without considering other things.

After all, it must be remembered that the human element is an important factor of all the factors in capitalization, and when one is at a loss to explain certain features of capitalization statistics, one may lay them at the door of the human element, with the same liberty that the cost accountant takes in charging unexplainable cost items to "overhead expenses."

We have endeavored to show how capitalization is affected by certain factors. Just how much each of these factors contribute to shaping capitalization in general, and how far may these factors be analyzed, we leave to further investigations in future, when conditions will be more favorable for exhaustive study, both in the way of abundance of materials to work with and in more uniformity of regulation and accounting among the different states, to which the electric railways today seem to tend.

F I N I S .