

THE EFFECT OF RAILROAD TRANSPORTATION IN CHINA

1912-1927

By

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I. The General Situation

By the end of the Ch'ing Dynasty, several important railroads had been constructed, such as the Peking-Moukden Line 京奉路, the Peking-Hankow Line 京漢路, the Tientsin-Pukow Line 津浦路, the Peking-Suiyuan Line 京綏路, the Shanghai-Nanking Line 滬寧路, the Canton-Kowloon Line 廣九路, etc. Railroads in China have been studied in many respects, but few dealt with the effects of railway transportation.⁽¹⁾ Most materials concerning railroads in China are available now, and it is time for us to evaluate the effects of railroad transportation. This is the purpose of this paper. As the topic is too broad to be dealt with in a short paper, this paper confines its purpose to evaluating only the direct effects of railroad transportation.

(1) Only two works in Chinese may be mentioned regarding railways in relation with economic development, i. e.

何漢威：京漢鐵路初期史略，香港，1979。

張瑞德：平漢鐵路與華北的經濟發展，臺北，1980。師大歷史研究所，碩士論文。

Railroads are the world's most efficient form of transportation⁽²⁾. W. W. Rostow emphasizes that "the introduction of the railroad has been historically the most powerful single initiator of take-off." The railroad has had three major kinds of impact on economic growth:

1. It has lowered internal transport cost, brought new areas and products into commercial markets;
2. It has been a prerequisite in many cases to the development of a major new and rapidly enlarging export sector;
3. the development of railways has led on to the development of modern coal, iron and engineering industries.

But Rostow also mentions that where the prerequisites have not existed, very substantial railway construction may fail to initiate a take-off, as for example in India, China, etc.⁽³⁾ Therefore, railroad transportation in China is going to be examined on the following two assumptions:

1. Impact of the railroad lies on its forwards linkage effects; transportation is its forwards effects, through which social and economic development is stimulated.
2. The development of its function depends on the political, social and economical situation of the area. It means that the society plays an important role in using this new instrument for transportation.

Railroad transportation contains two parts, one is the passenger traffic, the other is the freight traffic. Before examining their effects, it is necessary

(2) M. T. Farris and Paul. T. McElhiney: *Modern Transportation Selected Readings* (N. Y., 1967), pp. 4-7. Six ways of the efficiency of railroads are mentioned.

- a. Rolling resistance of a steel wheel on a steel rail is fantastically low.
- b. Manpower efficiency.
- c. Near-invulnerability to weather.
- d. Compactness-saves time and saves space.
- e. Fuel economy.
- f. Riding the wind.—The wind pushes the train forwards.

(3) W. W. Rostow: *The Stages of Economic Growth* (Cambridge, 1960), pp. 55-56.
Moscs Abramovitz: "The Economic Characteristics of Railroads and the Problem of Economic Development," *Far Eastern Quarterly*, Vol. XIV, No. 2 (Feb. 1955), pp. 169-170.

to outline the length, the equipment, and the location of the railroads, which are shown in Table 1 and Table 2.

Table 1. Length and Locations of Railroads in Kms

Year	1912	%	1927	%	Index number.	1912=100.
North of the Yangtze R.	4,188	71.6	5,485	57.3	131.0	
South of the Yangtze R.	1,145	19.6	1,973	20.6	172.3	
Manchuria	516	8.8	2,114	22.1	309.7	
Total	5,849	100.0	9,572	100.0	163.7	

Sources: 楊承訓：“三十年來中國之鐵路事業”，三十年來之中國工程（臺北，1967），pp. 11-36.

Note: Railroads owned by foreign powers are not included.

Table 2. Equipment of the Railroads

Year	1912	1927	Index (1912=100)
Locomotive engines	600	807	188.5
Drawing Power (in tons)	5,619	8,293	148.6
Passenger Cars	1,607	1,355	127.0
Passenger Seats	45,177	78,371	173.5
Freight Cars	8,335	11,664	139.9
Freight Capacity (in tons)	183,224	304,198	166.0

Sources: 嚴中平等編：中國近代經濟史統資料選輯（上海，1955），pp. 194-196.

Note: The number of Passenger Cars is for the year of 1915, not for 1912.

For details, see Appendix 1 and 2.

From the two tables above, the capacity of the railroad transportation in 1927 increased about 50-60 percent of that in 1912. As to the distribution in regions, Manchuria owned only 8.8 percent in 1912 but, increasing rapidly, it owned 22 per cent in 1927. If the Russian and Japanese owned railroads in Manchuria were included, there were 4,248 kilometers of railroads. As to

the region north of the Yangtze River, there was 57.3 percent of railroads in 1927, but the area was much larger than Manchuria. The region south of the Yangtze River owned the smallest amount of railroads in terms of percentage of density (length of railroads per thousand square kilometers).⁽⁴⁾ So far as contributions rendered by the railroads go, Manchuria would take the lion's share, North China would take a fair share, and South China, the least significant share.

The general development of railroad transportation is shown in the following table.

Table 3. Railroad Transportation
1912-1927 (in million) Index 1915=100

Year	Passenger-Kms	Index	Ton-Kms of Freight carried	Index
1912	1,623	163	2,432	108
1915	993	100	2,251	100
1916	2,064	208	2,620	116
1917	2,128	214	2,767	123
1918	2,321	234	3,426	152
1919	2,519	254	3,863	172
1920	3,162	318	4,541	202
1921	3,162	318	4,710	209
1922	3,321	334	3,982	177
1923	3,413	344	5,137	228
1924	3,582	361	4,572	203
1925	3,761	379	4,111	183
1926	2,596	261	2,422	108
1927	2,663	268	2,661	118

Sources: 嚴中平等：中國近代經濟史統計資料選輯，p. 206；鐵路年鑑，第一卷，p. 224.

Note: Some of the national railroads were not included in some of the years.

(4) 王勳育：近代中國的道路建設（香港，1969），p. 101.
交通史路政編（南京，1936），Vol. 1, pp. 5-6.

Table 4. Railroad Revenue

1912-1927

Index 1915=100.

Year	Total Revenue	Passenger Receipts			Freight Receipts		
		1,000 Ch\$	Index	%	1,000 Ch\$	Index	%
1912	46,719	18,866	86	40.4	24,021	71	51.4
1915	57,062	22,044	100	38.6	33,841	100	59.3
1916	62,762	25,656	116	40.9	35,878	106	57.2
1917	63,784	25,749	117	40.3	36,951	109	57.9
1918	77,652	30,311	138	39.0	45,945	136	59.2
1919	83,047	32,612	148	39.3	48,728	144	58.7
1920	91,444	36,814	167	40.3	52,450	155	57.4
1921	96,451	36,102	164	37.4	57,453	170	59.6
1922	99,556	37,650	171	37.8	55,732	165	56.0
1923	119,406	40,603	184	34.0	73,430	217	61.5
1924	118,511	44,824	203	37.8	68,609	203	57.9
1925	127,522	49,083	223	38.5	72,338	214	56.7
1926	99,342	42,600	193	42.9	54,587	161	54.9
1927	105,018	46,827	212	44.6	56,296	166	53.6

Sources: 嚴中平等：中國近代經濟史統計資料選輯，p. 208.

The general tendency of the railroad transportation indicators was on the increase. However, passenger traffic decreased in 1926 and 1927. Freight traffic decreased greatly, beginning in 1924, two years earlier than that of passenger traffic. So did the railroad receipts. It seems that freight traffic is easily disturbed by the political situation.

II. Passenger Traffic

Sixteen railroads are taken for comparative studies. The name of the

railroads are given in initial letters and marked with different numbers. ⁽⁵⁾ Number of passengers per kilometer of each line are given in Table 5.

Table 5 shows that the prosperous lines are the first three lines, i. e., the Shanghai-Nanking Line, the Shanghai-Hangchow-Ningpo Line, and the Canton-Kowloon Line. As the average number of passengers per kilometer does not exactly reveal the prosperity of the line, the passenger receipts may be taken for consideration. Supposing that the fare rates did not differ much from line to line, it would show more correctly the prosperity of the business of the lines. The passenger receipts of each line was recorded in Table 6.

(5)

No.	Name of the Lines	Initials	in Chinese
1.	The Peking-Moukden Line	P-M L.	京奉路
2.	The Peking-Hankow Line	P-H L.	京漢路
3.	The Chuchow-Pingsiang Line	C-P L.	株萍路
4.	The Kiaochow-Chinan Line	K-C L.	膠濟路
5.	The Peking-Suiyuan Line	P-S L.	京綏路
6.	The Taokow-Chinghwa Line	T-C L.	道清路
7.	The Chengtien-Taiyuan Line	C-T L.	正太路
8.	The Shanghai-Nanking Line	S-N L.	滬寧路
9.	The Pien-Loyang Line	P-L L.	汴洛路
10.	The Shanghai-Hangchow-Ningpo Line	S-H-N L.	滬杭甬路
11.	The Changchow-Amoy Line	C-A L.	樟廈路
12.	The Peking-Pukow Line	P-P L.	津浦路
13.	The Canton-Kowloon Line	C-K L.	廣九路
14.	The Nanchang-Kiukiang Line	N-K L.	南潯路
15.	The Canton-Hankow Line	C-H L.	粵漢路 (湘鄂段)
16.	The Chilin-Changchun Line	C-C L.	吉長路

Table 5. Number of Passenger Per Km.

Lines	1915	Rank	1923	Rank
1 P-M L.	2,004		4,001	
2 P-H L.	2,249		3,385	
3 C-P L.	3,351	5	2,265	
4 K-C L.	2,837		9,179	4
5 P-S L.	1,809		2,283	
6 T-C L.	1,475		2,494	
7 C-T L.	1,021		1,714	
8 S-N L.	16,561	1	33,143	1
9 P-L L.	2,829		5,211	
10 S-H-N L.	12,034	3	21,839	2
11 C-A L.	6,761	4	6,038	
12 P-P L.	3,156		3,756	
13 C-K L.	15,389	2	15,153	3
14 M-K L.	1,502		2,276	
15 C-H L.	3,027		1,388	
16 C-C L.	1,046		7,720	5

Sources: See Appendix 3.

Note: when numbers for 1923 are not available, numbers for 1921 take their place.

As seen from Table 6, the most prosperous lines in passenger traffic are: the Shanghai-Nanking Line, the Shanghai-Hangchow-Ningpo Line, the Peking-Pukow Line, the Peking-Moukden Line, the Peking-Hankow Line, and the Chilin-Changchun Line. To rank them more exactly, the statistics of 1915 and 1923 of the average passenger kilometers per kilometer of each line are recorded in Table 7.

upon comparison of Table 5 with Table 6, lines with comparatively smaller passenger per kilometer volume but with larger receipts are those lines of long distance, such as the Peking-Moukden Line, the Peking-Hankow Line, and the Peking Pukow Line. Conversely, there are those lines of short distance, such as the Changchow-Amoy Line, with larger passenger volume but with smaller receipts.

Table 6. Passenger Receipts Per Kilometer in Ch \$.

Lines	1915	rank	1923	rank
1 P-M L.	6,291	2	6,619	4
2 P-H L.	5,009	3	5,996	
3 C-P L.	1,163		1,208	
4 K-C L.	3,298		5,944	
5 P-S L.	2,063		2,835	
6 T-C L.	843		1,389	
7 C-T L.	1,846		2,700	
8 S-N C.	8,398	1	17,472	1
9 P-L L.	3,437		5,458	
10 S-H-N L.	4,757	4	10,645	2
11 C-A L.	1,523		1,406	
12 P-P L.	4,017		7,686	3
13 C-K L.	4,567	5	3,871	
14 N-K L.	895		3,355	
15 C-H L.	1,259		1,327	
16 C-C L.	2,740		6,264	5

Sources: See Appendix 4.

Table 7. Passenger-Kilometers Per Km.

Lines	1915	1923	Rank
1 P-M L.	219.6	515.2	3
2 P-H L.	127.0	474.2	4
8 S-N L.	7,746.1	28,329.5	1
10 S-H-N- L.			
12 P-P L.	134.4	596.8	2
15 C-K L.	363.0	402.4	5

Sources: See Appendix 3.

Note: Passenger-Kilometers of the Chilin-Changchun Line is not available.

From the tables above and those in appendixes, some phenomena may be traced as follows:

1. Passengers of most railroads increased gradually. It means the habitants accepted the new kind of transportation gradually.
2. According to the index number of the passengers of each line in 1923, the railroads may be classified into three groups (Index 1915=100):

A. Passengers decreasing:

Lines	Index number of 1923	Causes
3. The Chuchow-Pingsiang Line	64	Short length.
11. The Changchow-Amoy Line	90	New road and small base number
13. The Canton-Kowloon Line	99	Waterway competition.

B. Passengers greatly increasing

Lines	Index of 1923	Causes
4. the Kiaochow-Chinan L.	356	Migration
15. the Canton-Hankow L.	363	New road
16. the Chilin-Changchun L.	737	New road and small base number

C. Passengers gradually increasing

Lines	Index of 1923	Causes
1. P-M L.	200	Migration
2. P-H L.	150	
5. P-S L.	174	
6. T-C L.	169	
7. C-T L.	170	
8. S-N L.	201	
9. P-L L.	184	
10. S-H-N L.	130	Populous area
12. P-P L.	119	
14. N-K L.	151	

The normal case is the third group. The most prosperous lines are the Peking-Moukden Line, due to migration, and the Shanghai-Nanking Line, due to its locality in a populous area. Waterway competition prevented the Peking-Pukow Line from increasing its passenger transport greatly.

3. As to the classes of passengers, the percentage of each class of each line is shown in Table 8.

Table 8. Percentage of Classes of Passengers

Lines	1st & 2nd class		3rd & 4th class	
	1915	1923	1915	1923
1. P-M L.	4	5	96	95
2. P-H L.	1	1	99	99
3. C-P L.	2	—	98	100
4. K-C L.	2	2	98	98
5. P-S L.	3	2	97	98
6. T-C L.	2	1	98	99
7. C-T L.	2	3	98	97
8. S-N L.	4	5	96	95
10. S-H-N L.	4	4	96	96
11. C-A L.	—	1	100	99
12. P-P L.	1	2	99	98
13. C-K L.	4	6	96	94*
14. N-K L.	1	2	99	98
15. C-H L.	2	—	98	100

Note: *The percentage number is not available, that of 1921 is recorded for 1923.

Sources: See Appendix 3.

The great majority were the third and fourth class passengers. This means that most people were poor. Therefore, higher percentage of the first and second class passengers occurred in those developed areas, the key regions of China.

4. The passenger traffic of the railroads met with waterway competition in different ways, as indicated in the following table for 1924:

Table 9. Fare of Railways and Steamships, in Ch\$

Route	Railway Classes			Steamships	
	1	2	3	One way	Round trip
Shanghai-Nanking	9	4.5	2.25	18	28
Tientsin-Pukow	40.9	27.3	13.6	90	140*
Canton-Kowloon	6.5	3.3	1.6	6.3	11.7

Sources: U.S. Department of Commerce: *China, A Commercial and Industrial Handbook* (Washington D.C. 1926), pp. 499, 415, 530.

Note: *from Tientsin to Shanghai.

From the table above, the Canton-Kowloon Line met a very strong competitor from steamships. The fare of a junk was cheaper than that of a steamship. However, the Shanghai-Nanking Railroad had a very advantageous position in fare competition with that of steamships. It is no wonder that the Shanghai-Nanking Railroad was the most prosperous line in China. As to the Peking-Pukow Line, it had to reduce its fare rates many times in order to meet the competition from the steamship. For example, in 1913, the Peking-Pukow Line reduced its third class fare from Ch\$ 1.65 to 0.55, from Tientsin to Ts'angchow 滄州 in order to meet the competition of the Nien-hsien Steamer Company 義興輪船公司.⁽⁶⁾ This is why the rates were different from line to line and, even in one line, from section to section.

Beside the fare competition, travelling on railroads was safer and faster. This is also the reason why in 1925 and 1926, when the political situation was chaotic, both the passenger and freight traffic declined; however, passenger traffic did not decline as drastically as freight traffic.

(6) 交通史路政編，冊三，頁 1695, 1696.

III. Freight Traffic

Freight traffic of different lines are compared in the following table for the years 1915 and 1923 in tons per kilometer:

Table 10. Freight Traffic in Tons Per Km.

Lines	1915	Rank	1923	Rank
1. P-M L.	2,660	4	8,110	2
2. P-H L.	2,458		4,337	
3. C-P L.	6,238	1	4,219	5*
4. K-C L.	2,021		4,648	
5. P-S L.	1,358		3,515	
6. T-C L.	3,787	2	8,759	1
7. C-C L.	2,444		7,720	3
8. S-N L.	2,529	5	4,035	
9. P-L L.	734		3,266	
10. S-H-N L.	1,645		3,110	
11. C-A L.	128		120	
12. P-P L.	1,810		2,775	
13. C-K L.	423		566	*
14. N-K L.	227		1,552	
15. C-H L.	1,505		627	
16. C-C L.	2,924	3	6,311	4

Sources: See Appendix 5.

Note: *Freight tons carried in 1923 is not available, that of 1921 takes its place.

Table 11 shows more exactly the prosperity of the freight transport of each line. The most prosperous lines were the first six lines. The order of priority changes between 1915 and 1923, but they all remain in the first six. Some of these lines had their advantages of long distance, such as the Peking-Moukden Line, the Peking-Hankow Line, and the Peking-Suiyuan Line. Almost all of them were in the inland area, without waterway competition.

Table 11. Freight Receipts of Each Line Per Kilometer

Lines	1915	Rank	1923	Rank
1. P-M L.	4,352	5	10,748	6
2. P-H L.	9,459	1	17,048	1
3. C-P L.	5,639		4,578	*
4. K-C L.	6,994	2	14,366	4
5. P-S L.	6,187	3	11,163	5
6. T-C L.	3,397		6,953	
7. C-T L.	6,044	4	14,954	2
8. S-N L.	2,688		8,116	
9. S-L L.	1,586		6,991	
10. S-H-N L.	2,009		4,627	
11. C-A L.	51		98	*
12. P-P L.	1,890		8,427	
13. C-K L.	616		1,323	
14. N-K L.	336		3,043	
15. C-H L.	342		2,400	
16. C-C L.	3,949	6	13,880	4

Sources: See Appendix 4.

Note: *Freight receipts of 1923 are not available, those of 1920, or 1921 take their place.

As shown in Tables 10 and 11, all the lines increased their freight traffic greatly, except the Chuchow-Pinghsiang Line, because of the instability of local situation.

Comparing Table 10 with Table 11, we find that some lines were busy in freight traffic, but did not have good receipts, such as the Chuchow-Pinghsiang Line, the Taokow-Chinghwa Line, and the Shanghai-Nanking Line. The causes for this were that freight fare rates were lower, or that the cargoes they carried were of low value, or for short distance. Conversely, and for reasons opposite to the foregoing, some lines had less freight traffic, but did have good receipts, such as the Kiochow-Chinan Line, and the Peking-Suiyuan Line.

Some good lines, such as No. 8, the Shanghai-Nanking Line, No. 10, the Shanghai-Hangchow-Ningpo Line, No. 12, the Peking-Pukow Line, and No. 13, the Canton-Kowloon Line, locating in economically developed as well as urbanized regions, did not have much freight traffic. It is because they met with strong waterway competition in freight transportation. For example, in 1915, the cost for transporting one ton of cloth (Chinese made) from Tientsin to Pukow was Ch\$ 16.87. However, the waterways cost only Ch\$ 5.7. Therefore, the officials of the Tientsin-Pukow Line first reduced the cost to Ch\$ 8.5 per ton., and later in 1919, again to Ch\$ 7.0 a ton.⁽⁷⁾ In 1915, it cost Ch\$ 12.27 to transport a ton of cotton by ship, but it cost Ch\$ 14.4 by train, a cost which was later seduced to Ch\$ 8.5⁽⁸⁾

The junks gave the railroads a very strong competition in fare rates. The following table will provide an illustration:

Table 12. Freight Rates Per Ton-mile in Ch. Cents

Medium	Nanking	Hankow	Canton	Chinan	Tientsin
Railways	2.3	5.3	2.50	4.5	3.60
Junks	1.5	1.5	1.83	2.5	2.75

Sources: *China, A Commercial and Industrial Handbook*, pp. 415-713.

But there were some disadvantages in waterways transportation:

1. It was slower than the railways;
2. In winter, some rivers and ports froze and were closed to transportation;
3. Waterways transportation was less safe than that of railroads.

These were the reasons that railways gradually gained the upper hand in competition with waterways.

(7) 交通史路政編, Vol. 3, pp. 2301, 2304.

(8) *Ibid.* Vol. 3. p. 2298.

As to the composition of freight carried by the railroad, Tables 13, 14, 15, and 16 show the general development.

Table 13. Composition of Freight in 10,000 Tons.

Year	Manu- factured Goods	%	Mineral Products	%	Agricul- tural Products	%	Forest Products	%	Cattle	%	Others	%	Total
1916	162	9.7	791	47.5	311	18.7	29	1.7	46	2.8	325	19.6	1,664
1917	176	10.7	839	50.9	326	19.8	33	2.0	41	2.5	233	14.1	1,648
1918	196	10.8	864	47.6	491	22.1	42	2.3	42	2.3	269	14.9	1,814
1919	216	10.4	1,027	49.2	419	20.1	54	2.6	48	2.3	322	15.4	2,086
1920	219	10.1	1,057	48.9	518	24.0	58	2.7	42	1.9	269	12.4	2,163
1921	233	9.6	1,130	46.3	561	23.0	69	2.8	39	1.6	406	16.7	2,438
1922	235	11.7	944	46.8	461	22.9	60	3.0	49	2.4	268	13.2	2,017
1923	297	11.1	1,383	51.6	541	20.2	81	3.0	59	2.2	319	11.9	2,680
1924	237	9.8	1,173	48.3	421	17.3	70	2.9	50	2.1	476	19.6	2,427
1925	223	9.5	1,027	43.9	367	15.7	60	2.6	43	1.8	622	26.5	2,342

Source: 嚴中平等：中國近代經濟史統計資料選輯，p. 211.

Table 14. Composition of Freight in Million Ton-Kms.

Year	Manu- factured Goods	%	Mineral Products	%	Agricul- tural Products	%	Forest Products	%	Cattle	%	Others	%	Total
1916	310	11.8	1,006	38.4	809	30.9	44	1.7	126	4.8	325	12.4	2,620
1917	327	11.8	1,072	38.7	886	32.0	54	2.0	99	3.6	328	11.9	2,767
1918	408	11.9	1,369	40.0	1,095	32.0	66	1.9	97	2.8	392	11.4	3,426
1919	434	11.2	1,705	44.1	1,013	29.2	80	2.1	103	2.7	529	13.7	3,863
1920	452	10.0	1,769	39.0	1,650	36.3	93	2.0	101	2.2	475	10.5	4,541
1921	455	9.6	1,884	40.0	1,496	31.8	107	2.3	91	1.9	677	14.4	4,710
1922	510	12.8	1,624	40.8	1,132	28.4	102	2.6	126	3.2	487	12.2	3,981
1923	600	11.7	2,582	50.3	1,202	23.4	144	2.8	143	2.8	467	9.0	5,137
1924	518	11.3	2,138	46.7	910	19.9	125	2.7	120	2.6	766	16.8	4,572
1925	499	12.1	1,422	34.6	859	20.9	120	2.9	105	2.6	1,107	26.9	4,111

Sources: 嚴中平等：中國近代經濟史統計資料選輯，p. 213.

Table 15. Index Number of Freight Transport in Metric Tons.

1917=100.

Year	Manufactured Goods	Mineral Products	Agricultural Products	Forest Products	Cattle	Others
1916	100.0	94.3	95.4	87.9	112.2	101.0
1917	100.0	100.0	100.0	100.0	100.0	100.0
1918	111.4	103.0	123.0	127.3	102.4	110.1
1919	122.7	122.4	128.5	163.6	117.1	126.6
1920	124.4	126.0	158.9	175.8	102.4	131.3
1921	132.4	134.7	172.1	209.1	95.1	147.9
1922	133.5	112.5	141.4	181.8	119.5	122.4
1923	168.8	164.8	166.0	245.5	143.9	162.6
1924	134.7	139.8	129.1	212.1	122.0	147.3
1925	126.7	122.4	112.6	181.8	104.9	142.1

Table 16. Index Number of Freight Transport in Ton-Kms.

1917=100.

Year	Manufactured Goods	Mineral Products	Agricultural Products	Forest Products	Cattle	Others
1916	94.8	93.8	91.3	81.0	126.9	94.7
1917	100.0	100.0	100.0	100.0	100.0	100.0
1918	124.6	127.6	123.5	120.9	97.8	123.8
1919	132.6	159.0	174.3	147.3	104.1	139.6
1920	138.2	165.0	186.2	171.6	102.3	164.1
1921	138.9	175.7	168.8	198.2	92.1	170.2
1922	155.7	151.4	127.8	188.8	127.7	143.9
1923	183.3	240.8	135.6	264.8	144.1	185.7
1924	157.5	199.4	102.7	226.1	121.5	165.2
1925	152.5	132.6	97.0	220.6	105.9	148.6

Sources: Same as Tables 13, 14, pp.216-217.

From the tables above, we find a general increase of all kinds of cargoes,

except in the years of 1922, 1924 and 1925, when decreases appeared. This was because of the civil wars at that time.

From table 13, The tonnage percentage of the heaviest cargoes stood in the first place. For most of the years in the list, nearly 50% was minerals. Agricultural products was in the second place; for most of the years in the list, it stood over 20%. Manufactured goods came the third amounting to about 10% of the total.

As shown in Table 14, the composition of freight changes when ton-km replaces ton as the unit for measurement. The percentage for minerals decreased; while those for agricultural products, manufactures and cattle products increased. This means that the latter three kinds of cargoes were transported by the train for longer distances than minerals. As for forest products, the percentage remains unchanged. From the above tables, we may conclude that railways had contributed largely to transporting minerals for relatively shorter distance, and agricultural products for relatively longer distance.

As to the composition of freight of some important railroads, Table 17 shows their differences in percentage.

Table 17. Percentage of Freight in Real Tons.

Lines	Minerals		Agricultural Products		Manufactured Products	
	1915	1923	1915	1923	1915	1923
8 S-N L.	8	22	71	49	10	15
10 S-H-N L.	6	19	47	35	25	26
15 C-H L.	81	60	3	16	13	15
14 N-K L.	5	1	33	49	14	23
12 P-P L.	20	37	28	33	11	13
4 K-C L.	?	59	?	14	?	17
2 P-H L.	43	63	13	11	11	9

Sources: see Appendix 6.

From the table above, we may find that:

1. The Shanghai-Nanking Line, the Shanghai-Hangchow-Ningpo Line, the Peking-Pukow Line and the Peking-Hankow Line increased their transportation of minerals, because some lines near the mineral area reduced their coal fare rates and made it possible for coal transportation to cover a longer distance. Then the Shanghai-Nanking Line and the Shanghai-Hangchow-Ningpo Line increased their mineral percentage.
2. The Hupei-Hunan Section of the Canton-Hankow Line decreased its transportation of minerals because of political chaos at the time.
3. Some lines decreased their transportation of agricultural products in percentage, such as the Shanghai-Nanking Line, the Shanghai-Hangchow-Ningpo Line, and the Peking-Hankow Line. This was a kind of decrease only in percentage and not in real quantities.

IV. Comparison between Passenger Traffic and Freight Traffic

Let us start the comparison between passenger traffic and freight traffic from the problem of receipts. The general receipts of the railroad transportation is shown in table 4. The receipts of freight transport usually ranged from 51 to 60 percent of the total revenue. In terms of receipts, the train has transported more cargoes than passengers. However, table 18 contradicts this general pattern. It seems they offered different services.

From Table 18, we may classify the railroads into three groups:

1. Those lines whose passenger receipts are more than their freight receipts. Two major factors may account for this phenomenon:
 - 1) Those lines in a populous area, with a very strong competition from waterways in freight transportation, such as the Shanghai-Nanking Line, the Shanghai-Hangchow-Ningpo Line, the Canton-Kowloon Line, and the Nanchang-Kiukiang Line, carried more passengers than freight.

Table 18. Receipts Per Km in Ch\$.

	1915			1923		
	P-R	F-R	F-R/P-R x100	P-R	F-R	F-R/P-R x100
1 P-M L.	2,749	4,352	158	6,610	10,748	163
2 P-H L.	3,575	9,459	266	5,548	17,084	599
3 C-P L.	1,115	5,639	488	1,208	4,578	380
4 K-C L.	2,164	6,994	323	5,934	14,336	265
5 P-S L.	2,025	6,187	306	2,835	11,163	394
6 T-C L.	723	3,397	470	1,389	6,953	500
7 C-T L.	1,791	6,044	337	2,700	14,954	554
8 S-N L.	7,667	2,688	35	17,472	8,116	46
9 P-L L.	1,500	1,586	106	5,458	6,791	124
10 S-H-N L.	4,753	2,009	42	10,645	4,627	43
11 C-A L.	1,299	51	4	1,406	98	7
12 P-P L.	1,712	1,890	114	7,686	8,427	113
13 C-K L.	4,717	616	13	3,871	1,323	34
14 N-k L.	895	336	37	3,355	3,043	91
15 C-H L.	1,259	342	27	1,327	2,400	181
16 C-C L.	2,578	3,949	153	6,264	13,880	222

Sources: See Appendix 4.

Note: P—R stands for Passenger receipts. F—R stands for freight receipts.

*Receipts of 1923 is not available, that of 1920 or 1921 take their place.

- 2) Those lines of short length, such as the Changchow-Amoy Line, or newly built railroad, such as the Hupei-Hunan Section of the Canton-Hankow Line, offered passengers convenient transport.
2. For the lines whose freight receipts far exceed passenger receipts, such as the lines from No. 2 to No. 7, we should take notice of two phenomena.
- 1) These lines have been in existence for a longer period. This is also apparently the case with lines of group one; as time went on, their freight receipts increased too.

- 2) The lines were in a mineral area, and some were constructed mainly for coal transportation, e. g. the lines of No. 3, No. 6, and No. 7.
3. For those lines whose freight receipts exceed their passenger receipts by one to 50 percent, e. g. the lines of No. 1, No. 2, and No. 16, we offer the following explanations:
 - 1) The lines covered a long distance.
 - 2) The lines existed in an economically developing area, where migration brought about large passenger receipts.

From the comparison above, we may conclude that railroads rendered their service differently from place to place, according to the economic situation of the regions through which they passed.

V. The Effect of Railroad Transportation

Up to 1927, China had built 9,572 kilometers of railroads. In addition, foreign powers owned another 4,330 kilometers of railroads in China. The total railroads were about 13,900 kms. Most of them were constructed in North China and Manchuria. This really contributed a great deal to the economic development in North China, especially in Manchuria. It offered a prompt and economic form of transportation. The fare of different mediums for transportation in 1924 is given in table 19.

Except junks, no other means of transportation could give cheaper fare rates than railroads. If "social savings" are considered, there must be some "social savings" for China in this form of transportation.

To evaluate the effect of railroad transportation in China during 1912-1927, is not an easy task. This is the reason why up to now, there have been few works have dealt with it. The evaluation in this paper is a tentative one,

Table 19. Rates Per Ton-mile

		in Ch. Cents				
Mediums	Localities	Shanghai (上海)	Nanking (南京)	Hankow (漢口)	Chinan (濟南)	Tientsin (天津)
Railroads		1.05	2.3	5.3	4.5	3.6
Junks			1.5	1.5	2.5	2.8
Carts		14.30	12.0	16.0	10.0	12.0
Pack Animals			33.0	40.0	25.0	29.8
Wheel Barrows		33.20	30.0	50.0	17.0	15.1
Coolie Carriers		81.40	40.0	80.0		31.5

Sources: *China, A Commercial and Industrial Handbook*, pp.501-713.

and centering on two aspects: one is the economic implication and the other is the social impact.

1. Effects relating to Economic Aspect.

As to the economic aspect, the treatment is confined to foreign trade and coal production, because the most valuable contribution of the railroad is its low-priced fare rates for transportation. In general, its cheaper cost would stimulate trade. In particular, its low rates for special heavy minerals would in their consumption as well as production. For coal, a commodity of considerable bulk for little value, inexpensive fare rates were of more than usual importance.

A. Foreign Trade.

Many factors which may be ascribed to the increase of China's foreign trade. Among them, the railroad was one of the most important. Besides economic growth, there were artificial factors. Foreign exchange and price fluctuation should be taken into account, when we calculate the volume of foreign trade over years. Therefore, the real value or index number of foreign trade must be reckoned by foreign exchange rates and wholesale price index number. The index numbers in the following table are reckoned by price index numbers (1912=100; 1923=137; and 1926=145.).

Table 20. Index Numbers Reckoned

Year	1912	1923	1926
Freight carried by railways in million ton-kms	2,432	5,137	2,422
Index number	100	228	108
Freight receipts in 1,000 Ch\$.	24,021	73,430	54,587
Index number	100	306	227
Index number reckoned	100	223	157
Foreign trade in million HK Taels	844	1,676	1,989
Index number	100	199	236
Index number reckoned	100	145	162
Foreign trade in million U. S. \$.	624	1,341	1,511
Index number	100	215	242
Index number reckoned	100	157	167

As to freight transported by the railroads in ton-kms, see table 4.

Sources: 楊端六：六十五年來中國國際貿易統計（1931），pp. 1-3.

From the table above, we may see that the foreign trade of China increased in correspondence with that of freight transport of railroads from 1912 to 1923. It seems that railroads were important to the growth of China's foreign trade. But in 1926, the index number of freight carried by railways decreased greatly; so did the freight receipts. However, the foreign trade of China still increased as compared with that of 1923. The explanations are as follows:

1. Foreign trade greatly increased in Manchuria in 1926, about 52% of that of 1923, and that was 22% the total foreign trade of China in 1926. However, there was only one railway, the Chilin-Changchun Line in the list of Table 11 for freight transport.
2. The freight transport of some railroads was not reported to the Ministry of Communications, therefore the total freight carried by railroads in ton-kilometers in 1926 is not available, and so the figures

in table 4 come some what below the actual volumes transported.

3. In comparing the foreign trade of 1926 of some ports with that of 1925, their increase and decrease correspond with the volume of their freight transport of railroads in that area. Table 21 will illustrate this situation.

Table 21. Value of Foreign Trade in Comparison with Freight Transport (in millions)

Ports	Export		Import		Railroads	Ton-kms	
	1925	1926	1925	1926		1925	1926
Tientsin	62.2	60.6	85.1	84.4	P-M L.	1,017	810
Kiacchow	32.7	35.8	35.7	37.1	P-H L.	850	485
Hankow	30.0	23.6	54.0	54.3	P-S L.	358	139
Shanghai	306.2	361.9	431.9	596.6	S-N L.	314	439
Nanking	3.4		4.3	4.3	S-H-N L.		
Canton	89.8	45.2	40.4	67.2	C-K L.	99	74
Kowloon	12.1	5.2	34.1	6.8			

Source: 楊端六等，六十五年來中國國際貿易統計， pp. 73-94; 凌鴻勛：中國鐵路概論， pp. 216-217.

Note: The freight transport of the Canton-Kowloon Line is in 1,000 tons.

The table above shows that foreign trade in Tientsin did not decline much; however, the freight traffic of the three main lines declined very conspicuously. This was the case in Tientsin. Because of the difficulties in rail transportation, huge consignments, already paid for, were held up in the interior, and imports accumulated at Tientsin awaiting an opportunity to proceed inland. In consequence, several heavy losses were incurred and many firms had to close down.⁽⁹⁾

If we take a long time survey, we recognize that foreign trade had very close relations with railroads. As most of the railroads were constructed in North China and Manchuria, foreign trade increased greatly in those areas.

(9) China Maritime Customs: *Foreign Trade of China, 1926* (Shanghai, 1927), p. 5.

The distribution of foreign trade in China is given in the following table:

Table 22. Percentage of Foreign Trade in China

Year	Central China		South China		North-China		Manchuria	
	Import	Export	Import	Export	Import	Export	Import	Export
1891-1893	56.5	46.8	40.2	47.1	30.0	4.9	0.3	1.2
1909-1911	50.1	49.9	29.2	28.1	10.9	5.2	9.8	16.7
1919-1921	52.1	40.5	18.6	22.9	13.1	10.7	16.2	25.9
1929-1931	57.4	37.1	15.5	14.6	12.4	15.0	14.7	33.3

Sources: 嚴中平等, 中國近代經濟史統計資料選輯, pp. 67-68.

In North China, Tientsin was the most important port, where foreign trade increased in percentage from 3.1% in 1891-1893 to 7.4% in 1919-1921. In Manchuria the foreign trade of Darien increased from 4.9% in 1909-1911 to 13.1% in 1919-1921.

When the foreign trade of some important ports is examined, the impact of railroads revealed more clearly.

Table 23. Average Value of Direct Foreign Trade at Each Port
in Million HK Taels. Index 1911-13=100

Ports	Export			Import		
	1911-1913	1924-26	Index	1911-13	1924-26	Index
Antung	2.7	37.1	1374	4.4	33.2	755
Newchwang	10.6	4.1	39	8.6	14.1	164
Dairen	24.9	136.6	549	26.6	85.8	323
Chenwangtao	1.2	3.4	283	2.6	2.4	92
Tientsin	8.3	56.8	684	39.4	81.9	208
Chefoo	5.3	7.7	145	4.9	3.9	80
Kiaochow	11.3	35.1	311	14.5	35.6	246
Shanghai	168.3	314.9	187	224.0	504.0	225
Chingkiang	0.4	0.08	2	4.3	4.8	112
Nanking	1.0*	4.0	400	1.8	4.2	233
Kiukiang	0.1	0.03	3	1.2	3.3	275

The Effect of Railroad Transportation in China

Hankow	18.0	24.3	136	24.5	56.3	230
Hangchow	—	—	—	3.7	0.1	3
Ningpo	—	—	—	2.1	5.6	267
Foochow	6.8	9.8	144	7.0	7.6	109
Amoy	2.6	4.9	188	11.7	15.6	133
Swatow	8.1	11.7	144	18.0	21.7	121
Canton	49.6	59.3	120	29.0	53.9	186
Kowloon	13.1	12.8	98	25.7	30.7	119
Mengtsz	9.9	11.3	114	7.0	16.9	241
Total	342.2	734.1	215	461.0	981.6	213

Sources: 楊端六等：六十五年來中國國際貿易統計，pp. 73-93.

Note: The asterisk means that the figure is for the year of 1914.

From the table above, the ports may be divided into four groups:

Export	Import
1. Index numbers decreased. Kowloon, Kiukiang Chingkiang, Newchwang. Average Index 70	Hankow, Chefoo, Chenwangtao. 57
2. Index numbers were between 100--150. Chefoo, Hankow, Foochow, Swatow, Canton, Mengtsz. Average Index 127	Chingkiang, Foochow Amoy, Swatow, Kowloon, 121
3. Index numbers were between 150--300. Shanghai, Amoy, Chenwangtao. Average Index 188	Newchwang, Tientsin, Kiaochow, Shanghai, Nanking, Kiukiang, Hangchow, Ningpo, Canton, Mengtsz. 220

4. Index numbers were above 300 Antung, Dairen, Tientsin, Kiukiang, Nanking. Average Index	559	Antung, Dairen	384
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The percentage of the export of each group may be tabulated as follows:

Groups	1911-1913	%	1923-26	%
1	24.2	7.1	17.0	2.3
2	97.7	28.6	124.3	17.0
3	172.1	50.3	323.2	44.0
4	48.2	14.1	269.6	36.7
Total	342.2	100.0	734.1	100.0

Groups 1 and 2 account for a small part of the total volume of exports. Groups 3 and 4 take the main part of the total volume. In group 3, Chengwangtao was opened as a port because of the railroad, and its exports increased. Amoy increased its exports because of its locality. The volume of exports at these two ports was small, or negligible. Shanghai is the main port of group 3, which accomplished 49.2% of the total export of the average value of 1911-1913, and 42.3% in 1923-26. Shanghai was certainly affected by the railroads near by.

As to group 4, the volume of export increased greatly. It is obvious that all of them were aided by railroads. The main part of this great increase is accounted for by two ports in North China, Tientsin and Kiaochow, and two ports in Manchuria, Antung and Dairen.

The percentage of import of each group may be tabulated as follows:

Groups	1911—1913	%	1923—1926	%
1	11.2	2.4	6.4	0.7
2	66.7	14.5	80.4	8.2
3	352.1	76.4	775.8	79.0
4	31.0	6.7	119.0	12.1
Total	461.0	100.0	981.6	100.0

The most important group is group 3, which increased not only in value but also in percentage. Almost all the ports in group 3, had railroads, except Ningpo, whose percentage was negligible, 0.5 and 0.6 respectively. The four ports in the north of the Yangtze River, Newchwang, Tientsin, Kiaochow and Hankow, doubled their value, but their percentage did not increase much. The five ports in the south of the Yangtze River doubled their import value, and increased their percentage.

From this analysis, it is apparent that the railroad, contributed to North China's and Manchuria's exports more than imports. South China, with comparatively fewer railroads, had more imports than exports. The basic reason is that there were more railroads in North China and Manchuria, and railroads transported more minerals and agricultural products than manufactured goods. For export, agricultural products played an important role. For import, manufactured goods played an important role. In South China, waterways had existed for a long time. This was a convenient way to transfer manufactured goods, and gave a very strong competition to freight transportation on the railroad.

B. Coal Production

The need for transport facilities for coal and for other minerals was one of the conditions that made the railroad a successful innovation in England.⁽¹⁰⁾ To transport coal was one of the most important object for the construction

(10) G. R. Hawke: *Railways and Economic Growth in England and Wales, 1840-1870* (London, 1970), p. 157.

of railroads in China. Some railroads, such as the Taokow-Chinghwa Line, the Chengtien-Taiyuan Line, and the Chuchow-Pinhsiang Line in addition to some special short coal lines, were purposely built for coal transportation. An investigation shows that about 73 percent of the total coal output of 1921 was produced in the coal fields near the railroads.⁽¹¹⁾ The coal fields near the railroads are enumerated in the following table:

Table 24. Coal Fields Near the Railroads

Railroads	Number of Coal fields	Coal fields area in 1,000 Ch. acre	Coal Produced in 1,000 tons
1. P-M L.	3	447	3,800
2. P-H L.	42	29,216	2,606
3. C-P L.	21	139	1,206
4. K-C L.	6	?	1,400
5. P-S L.	90	155	146
6. T-C L.	5	108	1,460
7. C-T L.	60	?	1,380
12. P-P L.	6	26	414
Total	233	30,270	12,412

Sources: 交通史路政編 Respective volumes.

Note: Some coal fields and their output were unknown.

The commodities carried by railroad indicate that railroads in North China transported more minerals than other kinds of commodities. For example, the Peking-Hankow Line and the Kiaochow-Chinan Line carried minerals amounting to more than 50 per cent of the total tonnage carried by those lines. In South China, only the Chuchow-Pinhsiang Line carried more minerals than other kinds of commodities. This special goods (coal) amounted to about 80-99 per cent of the total cargoes carried on that line.⁽¹²⁾ Hence, on the Changhsa-

(11) 嚴中平，中國近代經濟史統計資料選輯，p. 102.

The total coal produced in China in 1921 was 20,507,390 tons. If the coal of Manchuria was excluded, there was about 17,000,000 tons.

(12) 交通史路政編，Vol. 11, pp. 3559-3560.

Chuchow Section of the Canton-Hankow Line, about 60—98 per cent of its freight transport was minerals. ⁽¹³⁾ As to the percentage of coal in the minerals, an example of the Peking-Hankow Line shows that about 85 percent of the minerals was coal. ⁽¹⁴⁾ An investigation of coal carried by railroads reveals that about 92 per cent of coal was transported by rail in 1930—1932. ⁽¹⁵⁾ All figures of coal carried by different lines are shown in the table below:

Table 25. Coal Carried by Railroads, 1930—1932

Lines	in 1,000 tons	
	Coal	%
The Peking-Moukden L.	8,004	32.6
The Peking-Hankow L.	2,475	10.1
The Kiaochoh-Chinan L.	942	3.8
The Peking-Suiyuan L.	1,246	5.1
The Taokow-Chinghwa L.	768	3.1
The Chengtien-Taiyuan L.	780	3.2
The Peking-Pukow L.	163	0.7
The Canton-Hankow L. (Hupei-Hunan Sect.)	232	0.9
The Canton-Hankow L. (Canton Section)	15	0.1
The Lung-Hai Road	307	1.2
The South Manchuria R.	7,598	30.9
The Antung-Moukden L.	365	1.5
The Chinese Eastern R.	824	3.3
The Haifong-Yunnaufu R.	26	0.1
Other Lines	824	3.4
Total	24,568	100.0

Sources: 上海商業儲蓄銀行, 煤與煤業 (上海, 1935), pp. 128-129.

Owing to the cheap cost of the railroads for transporting coal, Chinese coal could be carried to some ports and exported to foreign countries. Therefore

(13) See appendix 6.

(14) 平漢鐵路年鑑 (漢口, 1932), pp. 191-192. For 1915, the percentage is 75, and for 1923, 88.

(15) The average annual production of coal from 1930 to 1932 was 26,552,517 tons.

See 嚴中平: 中國近代經濟史統計資料選輯, p. 102.

the coal imported from foreign countries to China did not increase much. The coal imported and exported is shown in Table 26.

Table 26. Coal Imported and Exported.

in 1,000 tons.

Year	Import	Index	Export	Index
1912	1,517	100.0	681	100.0
1913	1,691	111.5	1,489	218.6
1914	1,601	105.5	2,006	294.6
1915	1,400	92.3	1,316	193.2
1916	1,422	93.7	1,315	193.1
1917	1,444	95.2	1,576	231.4
1918	1,075	70.9	1,708	250.1
1919	1,173	77.3	1,477	216.9
1920	1,255	82.7	1,970	289.3
1921	1,362	89.8	1,886	276.9
1922	1,151	75.9	2,377	349.0
1923	1,366	90.0	3,109	456.5
1924	1,610	106.1	3,202	470.2
1925	2,753	181.5	3,003	441.0
1926	2,898	191.0	3,085	453.0
1927	2,319	152.9	4,014	589.4

Sources: Hsiao Liang-lin, *China's Foreign Trade Statistics, 1864-1949*, pp. 43, 93.

From the table above, coal exported increased from 1912 to 1927 almost five times. When we examine the import of native coal at each port, recorded in the annual reports of the Foreign Trade of China, published by the China Maritime Customs, we find that in South China, in the Ch'ing Period, there was little native coal imported. In the early Republican period, the native coal imported increased gradually. Some ports, especially Nanking and Soochow, decreased their native coal imports, because they could import native coal by way of rails instead of waterways.

It was general that ports without rails increased their native coal imports. Chefoo was the notable one, so were the ports in South China. Those ports with rails usually decreased their native coal imports, except Hankow, whose native coal import increased because Hankow used much coal of Ping-hsiang.

As to the native coal exported, the situation was usually the opposite. Most foreign coal was imported into the ports in Shanghai, Canton, Kowloon and Hankow. This case generally corresponded to the tonnages of steamers entered and cleared in those ports. But it was only the case in the Yangtze River and South China. In North China and Manchuria, only Chefoo imported

Table 27. Coal Produced in China

Year	in 1,000 tons	Index Number
1912	9,068	100
1913	12,880	142
1914	14,182	156
1915	13,497	149
1916	15,983	176
1917	16,982	187
1918	18,432	203
1919	20,147	222
1920	21,319	235
1921	20,507	226
1922	21,140	233
1923	24,552	271
1924	25,781	284
1925	24,255	267
1926	23,040	254
1927	24,172	267

Sources: 嚴中平等，中國近代經濟史統計資料選輯，pp. 102-103.

much more foreign coal than other ports. As to Tientsin, Dairen, foreign coal imported was very small. After 1913, there was no foreign coal imported. This means that railways supplied enough native coal for their consumers.

Owing to the cheap transportation cost of railroads, coal production increased gradually. Figures of annual production is recorded in table 27.

From 1912 to 1924, coal production increased by 84 percent in thirteen years. More than 80 percent of coal was transported by railroads. It is easy to see that railroads had contributed greatly to coal production.

2. Social Impact

As to the social impact of the railroads, this paper confines its examination to the movement of population. Since the railroad changed the traffic routes, new cities were built; some old cities increased their population greatly, and some other declined in population. We may divide the cities whose population figures are available into three groups. Their figures of population are recorded in the following tables.

Table 28. Group 1.

in 1,000 persons. Index 1911-16=100

Cities	Year	Population	1911-1916	1921	1929-31	Index
Newchwang 牛莊	1901	50	61	65	106	174
Dairen 大連			20	116	512	2560
Tientsin 天津	1903	322	750	800	1,388	185
Kiaochow 膠州			34	240	400	1176
Hankow 漢口	1901	850	826	1,468	1,788	216
Changhsa 長沙			100		385	385
Nanking 南京	1901	225	267	380	634	237
Shanghai 上海	1901	620	1,000	1,500	3,156	316
Swatow 汕頭	1901	38	66	85	181	274
Kiahsing 嘉興			40		102	255

The cities listed above increased their population enormously because of the railway as well as their localities.

Table 29. Group 2.

in 1,000 persons. Index 1911-16=100.

Cities	Year	Population	1911-1916	1921	1929-31	Index
Chungking 重慶	1931	300	598	497	499	83
Kiukiang 九江	1901	62	36	53	80	222
Wuhu 蕪湖	1901	102	122	126	140	115
Chingkiang 鎮江	1901	149	184	101	202	110
Amoy 廈門	1901	96	114	300	128	112
Chefoo 芝罘	1901	60	54	54	130	240

From the table above, population figures of Chungking and Chefoo are doubtful. We think it may be safer to put them into this group. In this group, four of them had no railroads, this needs no explanation. The other two had railroads, but their localities were in the middle of waterways. Chingkiang was also in the middle of the railroad. As to Kiukiang, its railway was short and had a very strong competition from waterways.

Table 30. Group 3.

in 1,000 Persons, Index 1911-16=100

Cities	Year	Population	1911-1916	1921	1929-31	Index
Soochow 蘇州	1908	300	250		260	104
Ningpo 寧波	1901	2,552	350	270	212	61
Foochow 福州	1901	650	624	320	322	52
Canton 廣州	1901	850	900	900	886	98
Yochow 岳州	1901	20	20	4	?	2

Sources for Tables 28-30. China Maritime Customs: *Decennial Reports*, 1892-1901, Appendix, 1902-1911, p. 351, 1912-1921, p. 450, 1922-1931, see each part. 中國現代化的區域研究(稿本)有關省分。

In this group, two of the cities had no rails. Three of them had rails. Soochow and Yochow was not in a good location. As to Canton, its population had grown enormously before 1892. Since many new ports were opened, foreign trade was diverted to other ports, but the population of Canton remained the same.

From this comparison, we recognize that railways changed the traffic routes, and so changed the city size.

As the railroad offered a faster and safer means of transportation, merchants did their business far beyond their own native provinces. For example, among the merchants in Honan Province along the Peking-Hankow Line, merchants from other provinces constituted the majority of the merchant circles in the earlier period of the Republic of China. Table 31 will prove this statement.

Table 31. Merchant Circles along the Peking-Hankow Line in Honan

Native Provinces	Percentage
Honan (河南)	35
Shanhsi & Shenhsi (山西、陝西)	25
Hopei & Shantung (河北、山東)	10
Kianghsi, Hupei & Hunan (江西、湖北、湖南)	10
Kwantung, Kwanghsi & Chekiang (廣東、廣西、浙江)	10
Other Provinces	10
Total	100

Sources: 東亞同文會：京漢線調報告書 (MSS). Vol. 11, No. 7, pp. 86—87.

Railroads stimulated migration. After some railroads had been constructed, local authorities made request to the Central Government, especially the Ministry of Communications, to give migrant laborers free pass or reduced rates. For example, in 1909, the Viceroy of Manchuria, and in 1913, the Governor of Shantung, made such requests. The Ministry of Communications agreed to reduce by half the rates of the third class for the migrant

laborers. In 1914, the Governor of Hei-lung-kiang made another application for free passes for flood refugees migrating to Manchuria. The Ministry of Communications again reduced the rates of the third class by five sixths.⁽¹⁶⁾

When the Peking-Suiyuan Railroad was settled, special rates was arranged for laborers migrating to North-west China. Other rails such as the Kiaochow-Chinan Line, the Peking-Pukow Line, etc. made special reduced rates for migrating laborers.⁽¹⁷⁾

Railroads contributed greatly to the migration of people, especially in Manchuria. The growth of population in Manchuria is shown in Table 32.

Table 32..

Year	Population (in 1,000)	Index	Average Yearly increase (in 1,000)
1864	3,189	100	
1884	4,737	148	+ 77.4
1895	3,025	95	- 171.3
1898	5,413	170	+ 800.0
1907	14,457	453	+ 1,004.9
1915	20,110	631	+ 706.6
1924	25,706	806	+ 621.8
1930	29,951	939	+ 707.5

Sources: 趙中孚：“1920—30年代的東三省移民”，中央研究院近代史研究所集刊， Vol. 2 (1971), p. 328.

Most of the people moving into Manchuria were migrants from China proper.⁽¹⁸⁾ The peak was around the years from 1898 to 1907. The Peking-Moukden Line reached Sanhaikuan in 1894, Hsing-min in 1903, Huang-ku-ten in 1907 (bought from Japan), and Moukden in 1912. It is apparent that the increase of migration had a close relationship with the railroad. Besides, the

(16) 交通史路政編, Vol. 3, pp. 1761-1770.

(17) Ibid. Vol. 3, pp. 1771-1772.

(18) China Maritime Customs: *Decennial Reports, 1922-1931* (Shanghai, 1933), p. 304. It was estimated at about 500,000 a year.

completion of the Kiaochow-Chinan Railroad in 1904 also contributed much because many natives of Shantung Province first took the train to Kiaochow, and then took steamships or junks to Dairen, where the Chinese Eastern Railroad and South Manchuria Railroad had been finished by 1903. No wonder that most of the migrants to Manchuria were natives of Shantung and Hopei, and that most of the migrants spread along the rialroads in Manchuria.

There was another special phenomenon among migrants to Manchuria. Most of these laborers, upon arrival, did not plan to settle down in Manchuria for a long time. An investigation published in 1917 revealed that only about one eighth of the migrants had planned to settle down in Manchuria. Most of them planned to stay there only for a few years.⁽¹⁹⁾ They hoped to go back to their native places for New Year festivals. Table 33 shows the movement of the people in and out of Manchuria.

Table 33. Movement of Population

Year	1. Moving in	2. Moving out	Stay	2/1
1921	208,940	109,780	99,160	47.5
1922	350,000	(175,000)	(175,000)	50.0
1923	341,368	240,565	100,803	70.5
1924	384,730	200,046	184,684	52.0
1925	472,978	237,746	235,232	50.3
1926	566,725	323,694	243,031	57.1
1927	1,050,828	341,599	709,229	32.5

Sources: 趙中孚：“1920-30年代的東三省移民”，中央研究院近代研究所集刊，Vol.2 (1971)，p. 330.

About 50 per cent of the migrants moved out every year, because half of the migrants went back home in the winter and returned to Manchuria in the spring. In the winter, waterway transportation was not available; the railroad offered the only traffic service for the people.

(19) 南滿鐵路調查課：南滿出稼移往漢民の數的事實（昭和六年，大連），pp. 26-28.

In time of emergency or disaster, the train with high speed provided prompt delivery of food for the unfortunate, or moving them to another places; they were offered free passes or half-price of the third class ticket. For example, in 1920 and 1921, the Peking-Moukden Line gave free passes to more than 25,000 Chinese refugees returning home from Kyakhta (恰克圖) and Urga (庫倫).⁽²⁰⁾ In 1920 and 1921, because of the flood in North China, the railroads transported 392,165 tons of food and hence lost Ch\$ 8,686,500 of its revenue.⁽²¹⁾

VI. Conclusion

China did have a number of efficient railroads and enjoyed their prompt transportation, as discussed in the foregoing sections. However, the result was far from being satisfactory. The total kilometers of railroads in China in 1927 was about 13,900. The table below shows that China was backward in railroads in comparison with other nations.

The passenger-kms of some of the railroads in China in 1924 amounted

Table 34. Railroads in 1929

Countries	Length of Railroads in Kms.	Kms per 1,000 square Km ²	Km per 10,000 inhabitants
England	39,291	126.0	8.1
Germany	58,619	125.0	9.3
France	53,561	97.0	12.0
Italy	21,000	68.0	5.1
U. S. A.	402,859	43.0	33.9
Japan*	25,324	37.0	2.9
Russia	77,035	4.0	5.4
China	15,232	1.4	0.3

Note. *Japan's railroads includes those in Korea and Taiwan at that time.

Sources: 王勤育: 近代中國的道路建設, pp. 31-32; 葛肇燾: 鐵路通論 (上海1933), pp. 8-9.

(20) 交通史路政編, Vol. 3, pp. 1827-28.

(21) Ibid., Vol. 3, pp. 2240-2241.

to 3,582 million. If the population of China at that time was about 400 million, each person could have enjoyed about ten kilometers of railroad trip in 1924. The ton-kms of freight traffic of 1924 was 4,572 millions. Each person could have sent about 15 tons of cargo for one kilometer, or one ton of cargo for 15 kilometers. The figures are much lower than those for Taiwan today. In 1980 in Taiwan, the average ton-kms of transport was 144 for railroad and 417 for automobiles per capita, and the average passenger-kms was 440 for rails and 1,507 for automobiles. Private cars were not included.⁽²²⁾

We may make a rough estimate of the contribution of the railroads in China to the transportation of goods. In Manchuria, it would be the highest. Beans for example, carried by the railroads in Manchuria increased gradually. After 1920, there was about 80 percent increase or more of soy beans was transported by train.⁽²³⁾ In North China, cargoes carried to Tientsin by the rails also increased gradually except after the year 1925. Table 35 shows the percentage of freight carried to Tientsin by different routes:

The highest was 74 percent in 1924. This was the contribution of the railroads in North China.

The four big steam companies (The China Merchant's Steam Navigation Co., the China Navigation Co. of the Butterfield and Swire, the Indo-China Steam Navigation Co. of the Jardine, Matheson & Co., and Nishin Kisen Kaisha of Japan) transported 1,340,216 tons of cargo in 1927, and 1,615,269 tons in 1928, by the Yangtze River.⁽²⁴⁾ If we estimate it in ton-kms, it would be about 1,500 million.⁽²⁵⁾ If freight carried by other means was the same, it would be 3,000 million ton-kms, which equals a half of the ton-kms carried by the rails. If all the inland trade of cargoes carried by other means

(22) 聯合報：中華民國經濟年鑑，1981（臺北，1982），pp. 459,461.

(23) 雷慧兒：東北的豆貨貿易，1907—1931（臺北，1981），pp. 170, 112-113.

(24) 嚴中平，中國近代經濟史統計資料選輯，p. 250。即招商局、太古洋行、怡和洋行、日清公司。

(25) The Length of the Yangtze River is 2,200 kms from Wu-Sung-Kow to Chungking. Supposed the average mileage of the cargoes was 1,000 kms., the ton kms would be 1,500 million.

Table 35. Percentage of Cargoes Carried into Tientsin by Rails,
Boats and Other Mediums

Year	By Rails	By Boats	By Other Mediums
1912	53	44	3
1913	55	24	3
1914	55	41	4
1915	56	39	5
1916	60	36	4
1917	68	28	4
1918	65	33	2
1919	64	33	3
1920	71	25	4
1921	71.5	25.5	4
1922	74	23	3
1923	74	23	3
1924	74	23	3
1925	66	31	3
1926	43	54	3
1927	50	46	4

Sources: China Maritime Customs: *Decennial Reports*, 1912-1921, p. 160, 1922-31, p. 377.

than railroads were put together, it would be equal to or more than that of the total freight carried by the train. At least, we may assume that the amount of cargoes transported by rails might be the same as that by other means. This result was not satisfactory either. In 1890 in France, the quantity of freight carried by the rails was four times larger than that by waterways, It was five times larger in Germany in 1890, and three times larger in Russia in 1913. ⁽²⁶⁾

(26) 全漢昇：交通建設在落後地區經濟發展中的地位，財政經濟月刊，卷二期一（Dec. 1951），p. 22.

The basic causes for this unsatisfactory result of the railroads in China were the lack of enough facilities, the unsoundness of the management, as well as the nonexistence of the socio-economic prerequisites. (27)

Appendix 1. Cars and Locomotives of the Railroads, 1912-1927

Index 1915=100

Year	Locomotives		Passenger Cars		Freight Cars	
	Number	Index	Number	Index	Number	Index
1912	600	95	1,067	83	8,335	78
1915	629	100	1,280	100	10,625	100
1916	638	101	1,332	104	10,594	99
1917	648	103	1,315	103	10,659	100
1918	653	104	1,231	96	10,772	101
1919	707	112	1,323	103	11,273	106
1920	789	125	1,379	108	12,192	114
1921	884	141	1,345	105	13,206	124
1922	992	158	1,395	109	14,471	136
1923	1,130	180	1,698	133	16,768	157
1924	1,146	182	1,789	140	16,831	158
1925	1,131	180	1,803	141	16,718	157
1926	831	132	1,402	110	11,617	109
1927	807	128	1,355	106	11,664	110

Sources: 嚴中平，中國近代經濟史統計資料選輯 (Shanghai, 1955), p. 194.

(27) 交通史路政編, Vol. 1, pp.16-17.

Twenty-two factors were mentioned for the failure of the railroads. Among them, eight factors belong to the facilities of the railroad, seven belong to the administration and management of the railroad authorities, and seven to the socio-economic situations. 張瑞德：平漢鐵路與華北的經濟發展，1905-1937，pp. 32-70，mentions six factors for the failure of the Peking-Hankow Line.

Appendix 2. Numbers of Locomotive Engines Drawing Power, Passenger Seats, and Freight Capacity of the Railroads in China, 1912-1927

Year	Drawing Power		Passenger Seats		Freight Capacity	
	Tons	Index	in 1,000	Index	in 1,000 tons	Index
1912	?	?	45	74	183	75
1915	5,619	100	61	100	243	100
1916	5,719	102	62	102	241	99
1917	5,958	106	60	99	242	100
1918	6,030	107	62	102	243	100
1919	6,739	120	68	111	265	109
1920	7,917	141	70	114	301	124
1921	9,204	164	74	120	341	140
1922	10,796	192	78	128	393	162
1923	11,961	213	94	154	451	186
1924	12,156	216	99	163	453	186
1925	11,966	213	101	165	452	186
1926	8,416	150	81	133	310	128
1927	8,293	148	78	128	304	125

Sources: 嚴中平，中國近代經濟史統計資料選輯，p. 196.

**Appendix 3. Passenger Traffic of the Railroads, 1912-1924
The Peking-Moukden Line**

Year	1st class		2nd class		3rd class		4th class		Total Passengers in 1,000	Index	Average per km	P-kms in M.	Index
	Index	%	Index	%	Index	%	Index	%					
1915	100	2	100	2	100	96			1,980	100	2,004	217	100
1916	176	2	182	2	175	96			3,495	177	3,538	516	238
1917	230	2	239	3	188	95			3,788	191	3,835	579	267
1918	212	2	257	3	177	95			3,397	172	3,440	614	283
1919	200	2	219	3	174	95			3,503	177	3,546	596	275
1920	243	2	254	2	244	96			4,854	245	4,913	856	394
1921	219	2	251	3	225	95			4,497	227	4,551	822	379
1922	214	2	191	2	176	91	100	5	3,723	188	3,971	826	381
1923	248	2	226	3	183	88	132	7	3,953	200	4,001	509	235
1924	211	2	184	2	167	78	78	5	3,504	170	3,546	650	304

Sources: 交通史路政編，vol. 7, p. 481.

Length of the Line: 988 kms.

The Peking-Hankow Line

Year	1st class		2nd class		3rd class		4th class		Total Passengers in 1,000	Index	Average per km	P-kms in M.	Index
	Index	%	Index	%	Index	%	Index	%					
1912	101		135	2	97	98			2,188	80	1,804		
1913	126		157	2	98	98			2,671	98	2,202		
1914	130		147	2	101	98			2,766	102	2,281		
1915	100		100	1	100	99			2,729	100	2,249	154	100
1916	106		120	1	114	99			3,116	114	2,269	350	227
1917	107		128	1	124	99			3,383	124	2,789	352	229
1918	120		189	1	131	99			3,599	132	2,967	421	273
1919	172		258	2	146	98			4,023	147	3,317	480	312
1920	77		165	1	137	99			3,721	136	3,067	626	406
1921	53		115	1	121	99			3,300	121	2,721	527	342
1922	46		85	1	129	99			3,525	129	2,906	490	318
1923	48		96	1	151	99			4,106	150	3,385	515	334
1924	35		76	1	154	99			4,173	153	3,440	560	364

Sources: Same as above, vol. 8, pp. 1346-47.

Length of the Line: 1,213 kms

The Chuchow-Pinhsiung Line

Year	1st class		2nd class		3rd class		4th class		Total Passengers in 1,000	Index	Average per km	P-kms in M.	Index
	Index	%	Index	%	Index	%	Index	%					
1912	18		12	1	67	99			250	72	2,534		
1913	101		81	1	105	99			363	104	3,668		
1914	—		—		97	100			332	96	3,351		
1915	100		100	2	100	98			347	100	3,505		
1916	64		106	1	108	99			373	107	3,772		
1917	89		88	1	93	99			332	93	3,257		
1918	—		1		38	100			129	37	1,300		
1919	3		—		97	100			332	96	3,349		
1920	—		—		84	100			289	83	2,901		
1921	—		—		65	100			224	64	2,265		

Sources: Same as above, vol. 11, p. 3598.

Length of the Line: 99 kms

The Kiaochow-Chinan Line

Year	1st class		2nd class		3rd class		4th class		Total Passengers in 1,000	Index	Average per km	P-kms in M.	Index
	Index	%	Index	%	Index	%	Index	%					
1915	100		100	2	100	98	100		1,118	100	2,837		
1916	237		219	3	164	97	340		1,667	148	4,231		
1917	306		226	2	171	98	1,586		2,066	185	5,243		
1918	301		202	2	191	98	391		2,160	192	5,472		
1919	330		229	2	223	98	709		2,545	227	6,460		
1920	398		277	2	264	98	180		2,945	263	7,475		
1921	459		332	2	310	98	109		3,451	303	8,759		
1922													
1923	361		332	2	326	98			3,617	356	9,179		
1924	399		2,990	2	3,597	98			39,662	3,900	100,667		

Sources: Same as above, vol. 13, p. 5261.

Length of the Line: 394 kms

The Taokow-Chinghwa Line

Year	1st class		2nd class		3rd class		4th class		Total Passengers in 1,000	Index	Average per km	P-kms in M.	Index
	Index	%	Index	%	Index	%	Index	%					
1912	74	1	154	1	111	98			246	111	1,647		
1913	85	1	140	1	100	98			221	100	1,474		
1914	70	1	128	1	96	98			212	96	1,411		
1915	100	1	100	1	100	98			221	100	1,475		
1916	90	1	86	1	103	98			229	103	1,524		
1917	78	1	77	1	98	98			216	98	1,443		
1918	87	1	103	1	111	98			246	111	1,637		
1919	79	—	95	1	131	99			288	130	1,917		
1920	78	—	102	1	143	99			315	142	2,101		
1921	79	—	100	1	133	99			294	133	1,963		
1922	84	1	71	—	140	99			308	139	2,055		
1923	83	1	82	—	170	99			374	169	2,494		
1924	64	1	62	—	203	98			445	201	2,965		

Sources: Same as above, vol. 13, pp. 4942-43.

Length of the Line: 150 kms.

The Chengtien-Taiyuan Line

Year	1st class		2nd class		3rd class		4th class		Total Passengers in 1,000	Index	Average per km	P-kms in M.	Index
	Index	%	Index	%	Index	%	Index	%					
1912	76		83	1	108	98			264	108	1,088		
1913	94		90	2	105	98			258	104	1,063		
1914	111		96	2	106	98			263	106	1,083		
1915	100		100	2	100	98			249	100	1,021		
1916	84		114	2	97	98			239	97	985		
1917	105		121	2	110	98			273	111	1,123		
1918	119		140	2	112	98			279	113	1,147		
1919	157		160	2	127	98			315	128	1,298		
1920	133		212	3	145	97			362	147	1,489		
1921	134		234	3	141	97			352	143	1,450		
1922	159		261	3	146	97			267	149	1,509		
1923	202		274	3	167	97			416	170	1,714		
1924	219		238	2	204	98			507	206	2,085		

Sources: Same as above, vol. 12, p. 161-62.

Length of the Line: 243 kms.

The Peking-Suiyuan Line

Year	1st class		2nd class		3rd class		4th class		Total Passengers in 1,000	Index	Average per km	P-kms in M.	Index
	Index	%	Index	%	Index	%	Index	%					
1912	81	1	68	2	67	97			489	67	1,405	—	—
1913	128	1	11	2	99	97			730	99	2,099	—	—
1914	107	1	99	2	105	97			769	105	1,900	—	—
1915	100	1	100	2	100	97			733	100	1,809	28	100
1916	124	1	97	2	112	97			820	112	1,774	56	200
1917	140	1	99	2	128	97			933	127	2,020	59	211
1918	124	1	126	2	118	97			869	119	1,882	58	207
1919	225	1	159	2	159	97			1,169	159	2,381	79	282
1920	188	1	124	2	142	97			1,040	142	2,117	85	304
1921	185	1	82	2	144	97			1,046	143	1,875	96	343
1922	161	1	65	1	149	98			1,078	147	1,932	88	314
1923	202	1	68	1	176	98			1,274	174	2,283	105	375
1924	145	1	57	1	194	99			1,399	190	2,502	114	407

Sources: Same as above, vol. 9, pp. 2042-43.

Length of the Line: 1912-1913: 348 kms. 1914-1915: 405 kms. 1916-1918: 462 kms.
1919-1920: 491 kms. 1921— 558 kms.

The Shanghai-Nanking Line

Year	1st class		2nd class		3rd class		4th class		Total Passengers in 1,000	Index	Average per km	P-kms in M.	Index
	Index	%	Index	%	Index	%	Index	%					
1912	119	1	99	2	91	85	68	12	4,774	88	14,600		
1913	82	1	88	2	100	84	82	13	5,252	96	16,062		
1914	94	1	87	3	100	82	92	14	5,353	99	16,369		
1915	100	1	100	3	100	81	100	15	5,416	100	16,561		
1916	108	1	115	3	104	80	110	16	5,706	105	17,448		
1917	114	1	127	3	108	70	133	18	6,124	113	18,730		
1918	112	1	144	3	113	78	135	18	6,377	119	19,500		
1919	119	1	166	4	126	78	144	18	7,087	131	21,672		
1920	139	1	214	3	142	78	172	18	8,051	150	24,521		
1921	142	1	214	4	147	75	203	20	8,580	159	26,238		
1922	165	1	308	4	177	76	234	19	10,270	190	31,408		
1923	176	1	294	4	185	75	260	20	10,838	201	33,143		
1924	118	1	257	4	162	76	219	19	9,334	173	28,667		

Sources: Same as above, vol. 11, pp. 3336-37.

Length of the Line: 327 kms.

The Changchow-Amoy Line

Year	1st class		2nd class		3rd class		4th class		Total Passengers in 1,000	Index	Average per km	P-kms in M.	Index
	Index	%	Index	%	Index	%	Index	%					
1912	—		—		73	100			139	74	4,953		
1913	—		—		102	100			193	102	6,893		
1914	—		—		96	100			181	96	6,477		
1915	100		100		100	100			189	100	6,761		
1916	316		4,338	1	108	99			207	109	7,382		
1917	627		5,896	1	106	99			202	106	7,225		
1918	331		5,699	1	76	99			145	76	5,186		
1919	—		—		28	100			53	28	1,904		
1920	—		—		10	100			20	10	717		
1921	159		3,077	1	88	100			169	90	6,038		

Sources: Same as above, vol. 13, p. 5614.

Length of the Line: 28 kms.

The Peking-Pukow Line

Year	1st class		2nd class		3rd class		4th class		Total Passengers in 1,000	Index	Average per km	P-kms in M.	Index
	Index	%	Index	%	Index	%	Index	%					
1912	65	—	133	1	118	98			1,709	51	1,014		
1913	120	—	149	1	156	99			2,278	68	2,141		
1914	184	—	175	1	202	98			2,930	87	2,753		
1915	100	—	100	1	100	60	100	36	3,156	100	3,156	143	100
1916	98	—	104	1	121	61	106	32	2,650	84	2,650	329	230
1917	99	—	99	1	134	72	71	22	2,690	80	2,529	338	236
1918	189	1	169	1	158	90	6	2	2,511	75	2,360	389	272
1919	180	1	213	1	166	91	5	2	2,618	78	2,461	417	292
1920	150	—	215	1	186	86	8	2	3,083	92	2,868	513	359
1921	150	—	108	1	165	92	8	3	2,574	77	2,420	466	326
1922	260	1	337	2	195	90	15	4	3,091	92	2,905	480	336
1923	227	—	361	2	215	90	26	5	3,996	119	3,756	635	444
1924	167	—	281	1	219	76	16	3	4,105	122	3,858	959	671

Sources: Same as above, vol. 10, p. 2813.

Length of the Line: 1,064 kms.

The Canton-Kowloon Line

Year	1st class		2nd class		3rd class		4th class		Total Passengers in 1,000	Index	Average per km	P-kms in M.	Index
	Index	%	Index	%	Index	%	Index	%					
1912	21	—	34	2		98			1,680	75	11,503		
1913	43	—	51	2		98			1,824	81	12,493		
1914	49	—	65	2		97			1,796	80	12,299		
1915	100	1	100	3		96			2,247	100	15,389	53	100
1916	61	1	74	2		97			2,114	94	14,477	98	185
1917	97	1	103	3		96			2,051	91	14,050	103	194
1918	94	1	91	3		96			1,793	80	12,279	98	185
1919	122	1	106	4		95			1,858	83	12,724	108	204
1920	118	1	107	4		95			1,869	83	12,802	108	204
1921	153	1	151	5		94			2,212	99	15,153	133	251

Sources: Same as above, vol. 12, pp. 4669-70.

Length of the Line: 146 kms.

The Shanghai-Hangchow-Ningpo Line

Year	1st class		2nd class		3rd class		4th class		Total Passengers in 1,000	Index	Average per km	P-kms in M.	Index
	Index	%	Index	%	Index	%	Index	%					
1914	52		39	3	47	62	88	35	1,893	56	6,759		
1915	100		100	4	100	74	100	22	3,369	100	12,034		
1916	104		163	5	138	84	60	11	4,113	122	14,689		
1917	111		182	5	157	84	67	11	4,667	139	16,666		
1918	132		189	5	171	84	73	11	5,067	151	18,096		
1919	155		206	5	183	84	78	11	5,423	161	19,368		
1920	196		238	5	190	83	87	11	5,709	170	20,390		
1921	193		164	4	175	85	77	11	5,167	153	18,454		
1922	219		203	5	195	81	117	14	6,002	178	21,435		
1923	230		180	4	200	81	119	15	6,115	130	21,839		
1924	170		172	4	181	83	88	13	5,393	160	19,259		

Sources: Same as above, vol.11, pp.3933-34.

Length of the Line: 280 kms.

The Nanchang-Kiukiang Line

Year	1st class		2nd class		3rd class		4th class		Total Passengers in 1,000	Index	Average per km	P-kms in M.	Index
	Index	%	Index	%	Index	%	Index	%					
1916	100		100	1	100	99			192	100	1,502		
1917	328		360	2	148	98			280	146	2,189		
1918	336		427	2	137	98			259	135	2,026		
1919	636		569	3	165	97			313	163	2,449		
1920	502		544	2	165	98			315	164	2,458		
1921	539		574	3	161	97			307	159	2,395		
1922	486		523	2	181	98			342	178	2,675		
1923	365		463	2	154	98			291	151	2,276		
1924	272		418	2	172	98			325	169	2,542		

Sources: Same as above, vol.16, p.849.

Length of the Line: 128 kms.

The Canton-Hankow Line (Hupei-Hunan Section)

Year	1st class		2nd class		3rd class		4th class		Total Passengers in 1,000	Index	Average per km	P-kms in M.	Index
	Index	%	Index	%	Index	%	Index	%					
1913	32	—	29	1	36	99			58	36	1,100		
1914	106	—	112	1	130	99			209	130	3,934		
1915	100	—	100	2	100	98			160	100	3,027		
1916	82	—	133	2	110	98			177	110	3,336		
1917	98	1	107	3	65	96			105	65	1,977		
1918	—	—	—	—	18	100			27	17	515		
1919	3	—	—	—	62	100			97	60	1,626		
1920	—	—	—	—	65	100			102	63	1,917		
1921	135	1	16	—	231	99			365	228	897		
1922	249	—	25	—	266	79	100	21	533	333	1,285		
1923	143	—	24	—	233	63	189	37	580	363	1,398		
1924	49	—	9	—	293	59	285	41	781	488	1,883		

Sources: Same as above, vol.14, p.378.

Length of the Line: 53 kms.
1921-1924: 415 kms.

The Pien-Loyang Line

The Chilin-Changchun Line

Year	Total Passengers in 1,000	Average per km	Total Passengers in 1,000	Average per km
1915	521	2,829	134	1,046
1916	564	3,063	269	2,102
1917	559	3,037	287	2,244
1918	593	3,221	383	2,996
1919	768	4,173	384	2,997
1920	889	4,829	479	3,742
1921	890	4,839	431	3,364
1922	917	4,984	505	3,942
1923	959	5,211	988	7,720
1924	1,205	6,549	745	5,824

Sources: Same as above, vol.11, pp.3933-34; vol.12, p.4489.

Length of the P-L Line : 184 kms; of the C-C Line: 128 kms.

Appendix 4. Business Revenue of the Railroads, 1912-1924

The Peking-Moukden Line

in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/PR 100
1915	2,715,542	2,749	4,299,751	4,352	158
1916	6,215,460	6,219	7,670,444	7,764	123
1917	6,816,388	6,899	9,299,285	9,412	136
1918	8,368,845	8,470	11,463,678	11,603	137
1919	7,991,928	8,089	10,338,495	10,464	129
1920	10,198,928	10,323	11,644,586	11,786	114
1921	9,511,416	9,627	14,729,269	14,908	155
1922	8,427,956	8,530	10,424,043	10,551	124
1923	6,530,961	6,610	10,619,172	10,748	163
1924	7,231,871	7,320	8,648,584	8,754	120

Sources: 交通史路政編, vol.7, p.523.

The Peking-Hankow Line

in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/PR 100
1912	3,453,431	2,847	10,042,634	7,666	269
1913	4,183,438	3,449	11,909,073	9,091	264
1914	4,478,787	3,692	10,290,620	7,855	213
1915	4,336,331	3,575	12,390,740	9,459	266
1916	6,075,707	5,009	14,170,818	10,817	216
1917	5,487,035	4,524	13,032,464	9,948	220
1918	6,983,708	5,757	16,651,130	12,710	221
1919	7,661,217	6,316	18,434,793	14,072	223
1920	7,663,439	6,318	17,580,020	13,649	216
1921	6,162,255	5,080	17,893,852	13,659	290
1922	5,902,625	4,866	16,647,240	12,708	282
1923	6,703,387	5,548	22,333,301	17,048	599
1924	7,272,930	5,996	19,266,262	14,707	265

Sources: Same as above, vol.8, pp.1444-1445.

The Chuchow-Pingsiang Line

in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/PR 100
1912	77,421	782	152,606	1,541	197
1913	113,212	1,144	399,654	4,037	353
1914	110,761	1,119	350,158	3,537	316
1915	114,325	1,155	558,224	5,639	488
1916	115,088	1,163	607,697	6,138	528
1917	97,537	985	504,366	5,095	517
1918	88,246	891	387,055	3,910	439
1919	124,365	1,256	551,422	5,570	443
1920	119,583	1,208	453,252	4,578	380

Sources: Same as above, vol. 11, pp. 3646-47.

The Kiaochow-Chinan Line

in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/PR 100
1912	970,247	2,463	3,229,969	7,460	303
1913	951,849	2,416	3,123,324	7,213	299
1914	—	—	—	—	—
1915	852,546	2,164	3,028,594	6,994	323
1916	1,299,513	3,298	3,490,578	8,061	244
1917	1,464,174	3,716	3,765,195	8,696	234
1918	1,497,776	3,801	4,073,123	9,324	245
1919	1,760,547	4,463	5,004,994	11,559	259
1920	2,028,090	5,147	5,370,754	12,404	241
1921	2,205,613	5,598	5,974,951	13,759	246
1922	—	—	—	—	—
1923	2,338,180	5,934	6,207,571	14,336	265
1924	2,568,621	6,519	7,081,894	16,355	276

Sources: Same as above, vol. 13, pp. 5281-82.

The Effect of Railroad Transportation in China

The Peking-Suiyuan Line

in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/RP 100
1912	534,277	1,535	1,970,333	5,662	369
1913	818,545	2,352	2,208,036	6,345	270
1914	866,655	2,140	2,412,412	5,957	278
1915	819,931	2,025	2,505,921	6,187	306
1916	953,328	2,063	2,644,126	5,723	277
1917	937,796	2,030	2,504,641	5,421	267
1918	925,439	2,003	3,128,177	6,771	338
1919	1,212,782	2,470	3,290,054	6,701	271
1920	1,244,534	2,535	4,017,089	8,181	323
1921	1,203,887	2,157	3,750,769	6,722	312
1922	1,267,701	2,272	4,938,695	8,851	390
1923	1,581,884	2,835	6,229,132	11,163	394
1924	1,782,310	3,194	5,561,292	9,964	312

Sources: Same as above, vol.9, pp.2105-06.

The Taokow-Chinghwa Line

in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/RP 100
1915	108,386	723	509,500	2,397	470
1916	127,058	847	689,996	4,600	543
1917	130,069	867	782,529	5,217	602
1918	140,005	933	765,907	5,106	547
1919	172,469	1,150	754,528	5,030	437
1920	186,914	1,246	756,741	5,045	405
1921	182,885	1,219	834,989	5,567	457
1922	181,285	1,209	913,180	6,088	504
1923	208,417	1,389	1,042,939	6,953	500
1924	234,042	1,560	1,058,257	7,055	452

Sources: Same as above, vol.13, pp.4963-64.

The Shanghai-Nanking Line

in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/RP 100
1912	2,249,045	6,878	387,758	1,186	17.2
1913	2,521,891	7,712	528,737	1,617	21.0
1914	2,502,575	7,653	537,217	1,643	21.5
1915	2,507,000	7,667	879,046	2,688	35.1
1916	2,739,498	8,378	1,011,810	3,094	36.9
1917	2,923,234	8,940	1,177,867	3,602	40.3
1918	2,102,254	6,429	1,665,037	5,092	79.2
1919	2,523,701	7,718	2,023,592	6,188	80.2
1920	4,027,147	12,315	2,012,100	6,153	50.0
1921	4,670,721	14,284	2,123,787	6,495	45.5
1922	5,169,873	15,810	2,251,674	6,886	43.6
1923	5,713,317	17,472	2,653,885	8,116	46.5
1924	6,120,098	18,716	2,446,484	7,482	40.0

Sources: Same as above, vol.11, pp.3363-64.

The Chengtien-Taiyuan Line

in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/RP 100
1912	508,134	2,091	1,963,122	8,079	386
1913	430,148	1,770	1,662,327	6,841	386
1914	427,535	1,759	1,603,950	6,601	375
1915	435,170	1,791	1,468,752	6,044	337
1916	448,551	1,846	1,503,713	6,188	335
1917	478,908	1,971	1,802,790	7,419	376
1918	518,561	2,134	2,375,419	9,775	458
1919	567,377	2,335	2,469,434	10,162	435
1920	640,520	2,636	2,856,086	11,753	446
1921	610,171	2,511	2,329,349	9,586	328
1922	593,660	2,443	2,603,405	10,714	439
1923	656,190	2,700	3,633,729	14,954	554
1924	739,930	3,045	3,231,972	13,300	437

Sources: Same as above, vol.12, p.4181.

The Effect of Railroad Transportation in China

The Pien-Loyang Line

in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/RP 100
1915	276,054	1,500	291,874	1,586	106
1916	632,465	3,437	590,983	3,212	93
1917	590,549	3,210	724,519	3,938	123
1918	646,219	3,512	545,501	2,965	84
1919	754,022	4,098	787,253	4,279	104
1920	875,575	4,759	592,387	4,306	90
1921	909,040	4,940	1,043,822	5,673	115
1922	1,125,618	6,117	1,105,721	6,009	98
1923	1,004,187	5,458	1,249,651	6,791	124
1924	1,196,667	6,504	1,178,806	6,407	98

Sources: Same as above, vol.14, pp.716-17.

The Shanghai-Hangchow-Ningpo Line

in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/RP 100
1914	823,693	2,942	368,113	1,315	44.7
1915	1,330,839	4,753	562,549	2,009	42.3
1916	1,331,976	4,757	447,109	1,597	33.6
1917	1,593,228	5,690	554,088	1,979	34.8
1918	1,684,442	6,016	685,750	2,449	40.7
1919	1,873,519	6,477	747,992	2,671	41.2
1920	2,062,534	7,366	860,309	3,073	41.7
1921	2,356,557	8,416	874,887	3,124	37.1
1922	2,606,993	9,311	1,030,149	3,679	39.5
1923	2,980,518	10,645	1,295,428	4,627	43.5
1924	3,050,689	10,895	1,133,112	4,047	37.1

Sources: Same as above, vol.11, pp.3949-50.

The Changchow-Amoy Line

in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/RP 100
1912	25,012	893	694	25	2.8
1913	36,416	1,301	938	34	2.6
1914	34,209	1,222	1,077	38	3.1
1915	36,361	1,299	1,417	51	3.9
1916	42,636	1,523	1,534	55	3.6
1917	47,758	1,706	1,661	59	3.5
1918	32,572	1,163	1,820	65	5.6
1919	25,879	924	1,101	39	4.2
1920	10,724	383	1,302	47	12.3
1921	39,378	1,406	2,624	98	6.9

Sources: Same as above, vol. 13, pp. 5633-34.

The Peking-Pukow Line

in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/RP 100
1912	2,059,951	1,936	1,695,037	1,549	82.3
1913	3,372,356	3,170	2,963,499	2,708	87.9
1914	3,737,431	3,513	3,487,859	3,188	85.3
1915	1,821,963	1,712	2,067,703	1,890	114
1916	4,273,746	4,017	4,991,097	4,562	117
1917	4,693,041	4,411	5,001,267	4,572	101
1918	5,561,368	5,227	5,948,227	5,437	107
1919	6,157,066	5,787	6,554,058	5,991	106
1920	6,585,862	6,190	7,895,581	7,217	120
1921	6,145,522	5,776	9,236,104	8,443	150
1922	6,356,415	5,974	8,396,560	7,675	132
1923	8,177,546	7,686	9,219,553	8,427	113
1924	8,611,376	8,093	8,785,969	8,031	102

Sources: Same as above, vol. 10, pp. 2905-2906.

The Effect of Railroad Transportation in China

The Canton-Kowloon Line

in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/RP 100
1912	500,213	3,426	51,114	350	10.2
1913	660,242	4,522	56,255	385	8.5
1914	732,414	5,017	55,518	380	7.6
1915	688,691	4,717	89,918	661	13.1
1916	666,799	4,567	102,851	739	16.2
1917	778,940	5,335	123,838	848	15.9
1918	757,054	5,185	130,785	896	15.5
1919	835,029	5,719	121,730	834	14.6
1920	871,623	5,970	130,811	896	15.0
1921	1,118,766	7,663	140,362	961	12.5
1922	1,300,619	8,908	208,885	1,431	16.1
1923	565,139	3,871	193,205	1,323	34.2

Sources: Same as above, vol. 12, p. 4752.

The Nanchang-Kiukiang Line

in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/RP 100
1916	114,597	895	43,043	336	37.5
1917	214,078	1,672	128,531	1,004	60.0
1918	238,108	1,860	162,374	1,269	68.2
1919	278,857	2,179	260,573	2,036	93.4
1920	324,008	2,531	318,742	2,490	98.4
1921	326,843	2,553	210,237	1,642	64.3
1922	374,419	2,925	245,163	1,915	65.5
1923	429,481	3,355	389,486	3,043	90.7
1924	427,748	3,342	449,000	3,508	105.0

Sources: Same as above, vol. 16, p. 886.

The Canton-Hankow Line (Hupei-Hunan Section) in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/RP 100
1913	22,739	429	3,978	75	17.5
1914	62,828	1,185	12,776	241	20.3
1915	66,753	1,259	18,124	342	27.1
1916	91,778	1,732	52,226	985	56.9
1917	81,129	1,531	102,714	1,938	127
1918	76,354	1,441	55,530	1,048	72.8
1919	76,449	1,442	79,993	1,509	105
1920	67,912	1,281	80,271	1,515	118
1921	1,080,699	2,604	67,747	1,632	62.6
1922	657,665	1,585	1,093,198	2,634	166
1923	550,666	1,327	996,012	2,400	181
1924	588,721	1,419	1,349,242	3,251	229

Sources: Same as above, vol. 14, p. 419.

The Canton-Hankow Line (Canton Section) in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/RP 100
1912	377,717	3,161	137,952	1,154	36.5
1913	489,935	2,784	423,925	2,409	86.5
1914	536,641	2,781	475,592	2,426	87.2
1915	530,960	2,709	505,848	2,581	95.3
1916	560,561	2,501	909,814	4,060	162
1917	618,958	2,762	1,309,977	5,846	212
1918	608,798	2,717	1,438,665	6,420	236
1919	549,428	2,452	1,460,759	6,518	266
1920	513,558	2,292	1,390,405	6,204	271
1921	723,259	3,227	1,939,971	8,657	268
1922	670,457	2,993	1,917,087	8,558	286
1923	572,337	2,555	2,105,827	9,401	368
1924	494,857	2,209	2,231,203	9,961	451

Sources: Same as above, vol. 16, pp. 330-31.

The Effect of Railroad Transportation in China

The Chilin-Changchun Line

in Ch \$

Year	Passenger Receipts	Av. per km	Freight Receipts	Av. per km	FR/RP 100
1915	330,044	2,578	505,484	3,949	153
1916	350,666	2,740	513,851	4,014	146
1917	374,277	2,924	618,357	4,831	162
1918	535,432	4,113	1,094,514	8,551	204
1919	560,320	4,378	1,140,953	8,914	204
1920	675,927	5,281	1,285,155	10,040	190
1921	630,507	4,926	1,879,989	14,687	298
1922	661,985	5,172	1,880,692	14,693	285
1923	801,708	6,264	1,776,624	13,880	222
1924	842,129	6,579	1,610,558	12,582	191

Sources: Same as above, vol. 12, p. 4525.

Appendix 5. Freight Traffic of the Railroads, 1912-1924

Year	The P-M L.		The P-H L.		The C-P L.		The C-T L.	
	Cargo in 1000 tons	Average per km	Cargo in 1000 tons	Average per km	Cargo in 1000 tons	Average per km	Cargo in 1000 tons	Average per km
1912	—	—	2,000	1,587	195	1,969	475	1,955
1913	—	—	2,419	1,846	480	4,844	493	2,029
1914	—	—	2,179	1,663	511	5,158	523	2,154
1915	2,628	2,660	2,458	1,876	618	6,238	594	2,444
1916	4,984	5,045	2,660	2,030	659	6,660	770	3,170
1917	5,406	5,472	2,928	2,235	543	5,485	797	3,281
1918	6,014	6,087	3,146	2,401	379	3,827	1,069	4,399
1919	6,501	6,580	3,659	2,793	580	5,856	1,108	4,558
1920	7,025	7,111	3,684	2,812	457	4,617	1,146	4,716
1921	8,010	8,107	4,183	3,193	418	4,219	1,298	5,340
1922	6,208	6,284	3,633	2,995	—	—	1,204	4,954
1923	8,013	8,110	5,260	4,337	—	—	1,730	7,120
1924	6,839	6,923	4,563	3,762	—	—	1,573	6,474

Sources: 交通史路政編 Respective volumes.

Freight Traffic of the Railroads, 1912-1924

Year	The K-C L.		The P-S L.		The T-C L.		The P-L L.	
	Cargo in 1000 tons	Average per km	Cargo in 1000 tons	Average per km	Cargo in 1000 tons	Average per km	Cargo in 1000 tons	Average per km
1912	852	1,968	702	2,018	517	3,446	—	—
1913	947	2,186	775	2,227	444	2,958	—	—
1914	—	—	951	2,349	481	3,208	—	—
1915	875	2,021	550	1,358	568	3,787	135	734
1916	1,074	2,481	1,830	3,962	848	5,656	392	2,131
1917	1,288	2,974	1,109	2,401	997	6,650	469	2,551
1918	1,511	3,490	1,305	2,825	950	6,334	393	2,138
1919	1,733	4,003	1,380	2,823	948	6,317	492	2,281
1920	1,904	4,398	1,494	3,043	915	6,100	479	2,602
1921	1,971	4,553	1,407	2,866	1,035	6,897	728	3,959
1922	—	—	1,373	2,461	1,090	7,267	494	2,687
1923	2,012	4,647	1,962	3,516	1,314	8,760	601	3,266
1924	2,285	5,277	1,558	2,792	1,284	8,560	592	3,217

Sources: Same as above.

Freight Traffic of the Railroads, 1912-1924

Year	The S-N L.		The S-H-N L.		The C-A L.		The N-K L.	
	Cargo in 1000 tons	Average per km	Cargo in 1000 tons	Average per km	Cargo in 1000 tons	Average per km	Cargo in 1000 tons	Average per km
1912	489	1,499	—	—	0.5	16	—	—
1913	613	1,874	—	—	0.6	22	—	—
1914	575	1,757	—	—	0.7	26	—	—
1915	827	2,529	460	1,645	3.5	128	—	—
1916	896	2,740	365	1,304	1.9	68	29	227
1917	913	2,794	464	1,657	2.5	90	51	402
1918	1,131	3,460	465	1,660	2.1	76	140	1,097
1919	1,352	4,136	494	1,766	2.1	76	145	1,129
1920	1,399	4,277	585	2,090	0.9	35	172	1,343
1921	1,321	4,040	650	2,322	3.3	120	129	1,012
1922	1,459	4,462	782	2,793	—	—	435	3,398
1923	1,614	4,936	871	3,111	—	—	195	1,523
1924	1,300	3,976	640	2,286	—	—	210	1,641

Sources: Same as above.

Freight Traffic of the Railroads, 1912-1924

Year	The P-P L.		The C-K L.		The C-H L. (H-H S.)		The C-C L.	
	Cargo in 1000 tons	Average per km	Cargo in 1000 tons	Average per km	Cargo in 1000 tons	Average per km	Cargo in 1000 tons	Average per km
1912	578	529	29	200	—	—	521	4,073
1913	877	802	40	275	—	—	1,000	7,811
1914	968	885	38	260	—	—	126	936
1915	1,980	1,810	62	423	15	275	374	2,924
1916	2,147	1,963	78	532	80	1,505	388	3,031
1917	1,984	1,813	97	661	198	3,731	307	2,400
1918	2,316	2,117	95	652	47	895	448	3,504
1919	2,662	2,433	81	554	129	2,439	594	4,643
1920	2,898	2,649	79	544	135	2,542	654	5,112
1921	3,546	3,241	82	566	242	583	790	6,171
1922	2,921	2,670	—	—	274	660	774	6,047
1923	3,036	2,775	—	—	260	627	808	6,312
1924	2,755	2,518	—	—	371	893	742	5,797

Sources: Same as above.

Appendix 6. Composition of Freight Carried by the Rails
Percentage of the Cargo of the Shanghai-Nanking Line

Year	Agricultural products	Cattle	Mineral products	Forest products	Manufactured goods	others
1915	71	2	8	3	10	6
1916	72	3	4	3	11	7
1917	69	4	6	3	12	6
1918	70	4	5	2	12	7
1919	65	4	10	2	11	8
1920	63	4	10	3	12	8
1921	57	4	14	3	13	9
1922	56	4	17	2	12	9
1923	49	3	22	2	15	9
1924	47	4	22	2	17	8

Percentage of the Cargo of the Shanghai-Hangchow-Ningpo Line

Year	Agricultural products	Cattle	Mineral products	Forest products	Manufactured goods	others
1915	47	2	6	11	24	10
1916	37	4	6	10	28	15
1917	29	4	8	11	27	22
1918	37	4	8	10	30	11
1919	35	5	13	11	28	8
1920	32	4	18	13	25	8
1921	31	4	18	13	25	9
1922	33	4	19	13	22	9
1923	35	4	11	16	26	8
1924	24	4	13	19	30	10

Percentage of the Cargo of the Canton-Hankow Line
(Changsa-Chuchow Section)

Year	Agricultural products	Cattle	Mineral products	Forest products	Manufactured goods	others
1915	3	1	81	2	13	
1916	1	1	95	1	2	
1917	1	—	98	—	1	
1918	5	1	88	—	6	
1919	2	1	95	—	2	
1920	1	1	96	—	2	
1921	10	3	78	1	8	
1922	15	8	68	1	18	
1923	16	7	60	2	15	
1924	14	7	61	2	16	

Notes: Others are not included here.

Percentage of the Cargo of the Nanchang-Kiukiang Line
(Changsha-Chuchow Section)

Year	Agricultural products	Cattle	Mineral products	Forest products	Manufactured goods	others
1916	33	2	5	32	14	14
1917	38	3	5	36	16	22
1918	64	—	1	13	15	3
1919	50	—	1	17	14	2
1920	67	—	1	11	13	1
1921	40	—	1	38	19	2
1922	78	—	1	12	5	4
1923	49	—	1	16	23	11
1924	57	—	1	17	18	7

Percentage of the Cargo of the Peking-Pukow Line

Year	Agricultural products	Cattle	Mineral products	Forest products	Manufactured goods	others
1915	28	1	20	1	11	39
1916	38	4	21	2	11	24
1917	38	3	22	2	12	23
1918	38	3	23	2	10	24
1919	35	2	24	3	11	25
1920	42	2	26	3	12	15
1921	35	1	25	3	8	28
1922	34	1	32	2	11	20
1923	33	2	37	3	13	12
1924	21	3	38	3	16	19

Percentage of the Cargo of the Kiaochow-Chinan Line

Year	Agricultural products	Cattle	Mineral products	Forest products	Manufactured goods	others
1923	14	3	59	3	17	4
1924	13	2	58	3	15	9

Sources: for all the above six tables:
 vol. 10, pp. 2814-15; vol. 11, pp. 3334-40, 3934-35;
 vol. 13, p. 5261; vol. 14, p. 380; vol. 16, p. 850.

Percentage of the Cargo of the Peking-Hankow Line

Year	Agricultural products	Cattle	Mineral products	Forest products	Manufactured goods	others
1915	13	2	43	1	11	30
1916	13	3	47	1	12	24
1917	13	2	53	1	12	19
1918	14	2	53	1	10	20
1919	14	2	50	1	10	23
1920	16	2	51	2	9	20
1921	16	2	51	1	9	21
1922	13	2	57	1	11	16
1923	11	2	63	1	9	14
1924	10	2	63	1	10	14
1925	14	2	50	1	10	23
1926	13	2	47	—	9	29
1927	8	1	57	—	8	26

Sources: 平漢鐵路年鑑 (漢口 1932), Tables.

「鐵路運輸的效能（民國元年至十六年）」

中文提要

王 樹 槐

中國鐵路的建設，至清末時，幾條重要的鐵路，如京奉、京漢、津浦、京綏、滬寧、廣九等路，已經完成，此後在運輸方面的功能如何，至今未見有何專文或專書作全盤性的評價，而有關之資料，多已公布於世，似宜評估其貢獻，本文之目的在此。

鐵路運輸功能之發揮，基於兩項假設：

①鐵路建設具有連鎖作用 (forwards and backwards linkage effects)，運輸功能則為其向前之連鎖作用 (forwards effects)，進而影響社會經濟的發展。

②鐵路運輸功能發揮之程度，則視社會、經濟情況而定，亦即社會利用鐵路運輸功能的程度與社會經濟環境有密切的關係。

鐵路運輸分為兩部分：一為客運，一為貨運。此兩項的成績，與鐵路路線長短、設備多寡，以及路線所經過的地區有密切的關係。

客運方面，根據統計數字，有下列特殊之現象：

①全國呈現上升的現象，民國十四年之後則下降。各路亦呈現穩定的上升，唯各路的情況不一。

②各路一二三等旅客，以三等最多，占百分之九十五以上。

③客運發達的幾條路線是京奉、京綏、京漢、滬寧、滬杭甬、廣九、津浦等路，其原因是路線長，所經之區多為繁榮地區，人口多。

④客運發達的幾條路線，原多為水運較便地區，水運對貨運競爭力大，但對客運則未構成很大的威脅，原因是火車快捷而安全。

貨運方面，有下列之特殊現象：

①全國總計呈現上升的現象，民國十四年後則下降。各路亦呈現穩定性的上升，唯各路的情況不一。

②遭受水運競爭者，成長較慢。未見有持續性成長者，多因路線短，所經地區

特殊，或專為運煤而設者。

③貨運的類別，以鑛產居多，農產品次之，製造品又次之，再次為畜牧品及林產品，其他物品所佔比例亦大。

若以延噸公里計之，鑛產品及其他物品所佔比例與其重量所占之比例比較，則下降，表示運程較短，農產品及製造品所佔比例升高，表示運程較長，林產品及畜牧品所佔比例未大變。

④就成長而言，以民國十三年與民國元年比較觀之，林產品增加最多，鑛產品次之，製造品又次之，再次為農產品及畜牧品。

就上列各種特殊現象觀察，鐵路對客運、貨運均有甚大的貢獻。

客運方面，對人口移動貢獻大，對移民關外的貢獻尤大，因為對貧民訂有優待價，按三等價再打五折，甚至有免費者。

貨運方面，對鑛產品的貢獻大，尤以煤礦為然，民國十三年煤產量比民國元年增加百分之一百八十四。其次對農產品的貢獻較大，對製造品則較小，因為製造品價高質輕，鐵路運價貴，水運則較便利。對內地商業影響，因鐵路之故，出現長程的貿易商。對外貿易方面，有鐵路之港口，進出口量增加，沒有鐵路之港口，進出口量增加有限，甚至降低。

鐵路雖然有許多貢獻，但衡諸當時情況，似未達到理想的程度，推其原因，不外時局不寧，經營不善，以及社會使用此項運輸工具的能力有限所致。