

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Freight Transportation in the Soviet Union: A Comparison with the United States

Volume Author/Editor: Ernest W. Williams, Jr.

Volume Publisher: Princeton University Press

Volume ISBN: 0-87014-379-4

Volume URL: <http://www.nber.org/books/will59-1>

Publication Date: 1959

Chapter Title: Appendix B: Soviet Maritime Freight Traffic Statistics

Chapter Author: Ernest W. Williams, Jr.

Chapter URL: <http://www.nber.org/chapters/c2520>

Chapter pages in book: (p. 157 - 168)

APPENDIX B

Soviet Maritime Freight Traffic Statistics

BY GEORGE NOVAK

REVISED AND EXTENDED BY HOLLAND HUNTER

Total Maritime Traffic Carried in Soviet Bottoms

Statistics on maritime traffic are less comprehensive and less accurate than those on river traffic and cannot compare in either respect with railroad statistics. Several assumptions and approximations have to be made to estimate the volume of traffic in ton-kilometers, to obtain the desired breakdowns, and to expand the series beyond the periods for which they are readily available.¹

Soviet reporting of maritime traffic covers petty and grand cabotage, local traffic, and foreign trade traffic originated or terminated in Soviet ports, all carried in ships of the Ministry of the Maritime Fleet. It also includes freight carried in Soviet ships between foreign ports,² but excludes freight carried in foreign ships between Soviet ports as well as foreign trade carried in foreign ships originated or terminated in Soviet ports.

The absence of any detailed breakdowns into the above categories makes any attempt to estimate the approximate distribution of total maritime traffic after World War II extremely hazardous. Even in the 1920's and 1930's such data, especially on the average length of haul, were scarce. Estimating procedures are complicated by changes in coverage³ and by radical changes in the distribution of traffic among the various categories. We gather from the available sources that sometime in the late 1930's the Soviet statistical agencies attempted to estimate a series for the total volume of maritime traffic in ton-kilometers that would be homogeneous in coverage over time. Through

¹ Similar problems also exist in other countries, particularly in the United States.

² 32, 71.

³ The Soviet maritime fleet is owned and operated by various state agencies, cooperatives, collective farms, and other organizations. The greater part of the fleet, however, is under the jurisdiction of the Ministry of Water Transportation. In 1936 this ministry owned and operated 14.3 per cent of all Soviet ships which carried 75.1 per cent of the total freight traffic and 80.2 per cent of the total passenger traffic. They also carried nine-tenths of all tons originated (*perevozki*) and three-fourths of all passengers in petty cabotage. The ministry ships are the only Soviet ships in intersea and foreign trade shipping (82, 1937, No. 11, 10).

APPENDIX B

1934, maritime statistical authorities compiled ton-kilometers series, not as a sum of products of tons originated within a calendar year multiplied by the corresponding length of haul, but rather as a sum of products of tons terminated within a calendar year multiplied

TABLE B-1
TOTAL MARITIME TRAFFIC CARRIED IN SOVIET BOTTOMS, 1928-35

| | By Origination (1) | By "Terminated Trips" (2) | Col. 2 as % of Col. 1 (3) |
|--|-----------------------|------------------------------|------------------------------|
| A. MILLION METRIC TON-KILOMETERS | | | |
| 1928 | 10,100 | 9,100 | [90.0] |
| 1929 | 10,400 | 9,390 | 90.3 |
| 1930 | 13,200 | 10,110 | 76.6 |
| 1931 | 16,000 | 14,672 | 91.7 |
| 1932 | 20,100 | 18,190 | 90.5 |
| 1933 | 24,400 | 23,424 | 96.0 |
| 1934 | 27,600 | 26,363 | 95.5 |
| 1935 | 34,100 | 33,219 | 97.4 |
| B. THOUSAND METRIC TONS ORIGINATED | | | |
| 1928 | 8,300 | 7,900 | [95.2] |
| 1929 | 9,100 | 8,548 | 93.9 |
| 1930 | 12,400 | 11,264 | 90.8 |
| 1931 | 15,000 | 13,887 | 92.6 |
| 1932 | 15,100 | 14,828 | 98.2 |
| 1933 | 16,200 | 15,871 | 98.0 |
| 1934 | 22,600 | 21,687 | 96.0 |
| 1935 | 26,100 | 24,947 | 95.6 |
| C. AVERAGE LENGTH OF HAUL (KILOMETERS) | | | |
| 1928 | 1,217 | 1,152 | 94.7 |
| 1929 | 1,143 | 1,098 | 96.1 |
| 1930 | 1,065 | 898 | 84.3 |
| 1931 | 1,067 | 1,056 | 99.0 |
| 1932 | 1,321 | 1,230 | 93.1 |
| 1933 | 1,506 | 1,478 | 98.1 |
| 1934 | 1,221 | 1,215 | 99.5 |
| 1935 | 1,307 | 1,332 | 101.9 |

SOURCE

- Col. A-1, 1928: Col. A-2 divided by col. A-3.
 Col. B-1, 1928: Col. B-2 divided by col. B-3.
 Cols. A-1, B-1, 1929-35: 82, 1940, No. 9, 3.
 Cols. A-2, B-2, 1928: 66, 40. Converted from nautical miles.
 Cols. A-2, B-2, 1929-35: 42, 8.
 Cols. A-3, B-3, 1928: Estimated.
 Col. C-1, 1928-35: Col. A-1 divided by col. B-1.
 Col. C-2, 1928-35: Col. A-2 divided by col. B-2.

APPENDIX B

by the corresponding length of haul.⁴ The shift from the second method to the first raised the series somewhat as a result of a continuous upward trend in the series (for any given year there were more tons originated than received). This can be seen from Table B-1.

From a theoretical point of view, it might be considered preferable to use the ton-kilometer series based on "terminated trips" rather than the one based on traffic originated within a given year. The errors of adjustment and other difficulties, however, make it more expedient to use the series based on tons originated currently reported by Soviet statistical agencies.⁵

The above ton-kilometer series represents total maritime traffic carried in Soviet bottoms (petty and grand cabotage and local transport, as well as foreign trade traffic). Though tons originated are readily available for all these categories through 1935, ton-kilometers can be obtained only for a few years. The year 1935 appears to be the only exception when ton-kilometers and the average length of haul are available for most of the categories and breakdowns. Therefore we have to estimate the other years by various methods.

It might be appropriate to consider first the total and domestic traffic carried in Soviet bottoms and then to devote some attention to the theoretically most desirable coverage, namely domestic maritime traffic carried in bottoms of all flags.

Foreign and Domestic Maritime Traffic Carried in Soviet Bottoms

THE INTERWAR PERIOD (1913, 1928-40)

Each of the two major series mentioned above ("by origination" and "by terminated trips") is broken down into four categories: petty cabotage, grand cabotage, foreign trade,⁶ and local (domestic) traffic. The latter category represents the difference between the total traffic carried in Soviet bottoms and traffic carried by the so-called "transpor-

⁴ Soviet sources use two similar concepts: "tons terminated" (*po pribytiui*) and "completed trips" (*po zakonchenym reisam*). There is, at least in principle, some difference between the two concepts: the former refers to tons, the latter to trips. Furthermore, the sources do not state explicitly whether the second concept refers to tons originated or to tons terminated for "terminated trips." It probably refers to the latter.

⁵ Soviet statistical agencies continue to compile both series: "by origination" and "by completed trips." An editorial (40, 1951, No. 6, 1) explicitly gives the fulfillment of the 1950 Plan (102.1 per cent in tons and 105.5 per cent in ton-miles) for "terminated trips." It is possible that some of the reported percentage increases after World War II refer to "terminated trips," some to "tons originated," or to a combination of the two (for base and terminal years).

⁶ Traffic carried in Soviet bottoms between foreign ports seems to be included in the total and is reported separately for selected years (see 42, 6).

APPENDIX B

tation fleet," i.e., the fleet under the Ministry of Water Transportation.⁷ Domestic maritime traffic includes three categories: petty cabotage, grand cabotage, and local traffic. Petty cabotage is supposed to include maritime traffic originated and terminated between the

TABLE B-2
DOMESTIC MARITIME TRAFFIC CARRIED IN SOVIET SHIPS, 1929-35

| | By Origination | | | | By "Terminated Trips" | | | |
|--|----------------|--------------|--------------|--------------|-----------------------|--------------|--------------|--------------|
| | Petty (1) | Grand (2) | Local (3) | Total (4) | Petty (5) | Grand (6) | Local (7) | Total (8) |
| A. MILLION METRIC TON-KILOMETERS | | | | | | | | |
| 1929 | n.a. | n.a. | n.a. | n.a. | 4,278 | 1,330 | n.a. | 5,608 |
| 1930 | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| 1931 | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| 1932 | n.a. | n.a. | n.a. | n.a. | 7,282 | 4,682 | n.a. | 11,964 |
| 1933 | n.a. | n.a. | n.a. | n.a. | 8,210 | 5,782 | n.a. | 13,992 |
| 1934 | n.a. | n.a. | 50 | n.a. | 11,455 | 2,122 | n.a. | 13,577 |
| 1935 | 13,455 | 1,580 | 102 | 15,137 | 12,490 | 1,382 | n.a. | 13,872 |
| B. THOUSAND METRIC TONS ORIGINATED | | | | | | | | |
| 1929 | 7,357 | 119 | n.a. | n.a. | 7,277 | 100 | n.a. | 7,377 |
| 1930 | 10,337 | 224 | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| 1931 | 12,665 | 231 | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| 1932 | 12,696 | 415 | n.a. | n.a. | 12,927 | 380 | n.a. | 13,307 |
| 1933 | 12,989 | 264 | 261 | 13,514 | 13,139 | 352 | n.a. | 13,491 |
| 1934 | 18,523 | 228 | 402 | 19,153 | 18,162 | 211 | n.a. | 18,373 |
| 1935 | 20,057 | 122 | 747 | 20,926 | 19,969 | 114 | n.a. | 20,083 |
| C. AVERAGE LENGTH OF HAUL (KILOMETERS) | | | | | | | | |
| 1929 | n.a. | n.a. | n.a. | n.a. | 587 | 13,329 | n.a. | 760 |
| 1930 | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| 1931 | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| 1932 | n.a. | n.a. | n.a. | 1,035 | 563 | 12,305 | n.a. | 899 |
| 1933 | n.a. | n.a. | n.a. | n.a. | 124 | 16,420 | n.a. | 1,087 |
| 1934 | n.a. | n.a. | 124 | n.a. | 632 | 10,016 | n.a. | 739 |
| 1935 | 671 | 12,951 | 137 | 723 | 626 | 12,079 | n.a. | 691 |

SOURCE

Cols. A-1, A-2, A-3, B-1, B-2, B-3: 42, 6.

Cols. A-5, A-6, B-5, B-6, C-5, C-6: 65, 480.

Cols. A-7, B-7, C-7: "Terminated trips" were reported for the "transportation fleet" only, i.e., excluding local traffic. Therefore, no estimates of local traffic have been attempted here.

Cols. C-1, C-2, C-3, C-4, C-8: Cols. A-1, A-2, A-3, A-4, and A-8 divided by cols. B-1, B-2, B-3, B-4, and B-8.

Col. C-4, 1932: 28, 20.

NOTE: Nautical miles and nautical ton-miles in the original sources have been multiplied by 1.852 to convert them into kilometers and ton-kilometers.

⁷ The local maritime traffic series has a relatively short average length of haul (124 kms in 1934 and 137 kms in 1935) and appears in all breakdowns of Soviet maritime shipping agencies for 1935, except for the Baltic and Sochi State Maritime Steamship Agency (compare breakdowns in 42, 198-202).

APPENDIX B

ports of the same sea. However, an average length of haul exceeding 10,000 kilometers and the tiny volume of tonnage originated (about 2 per cent of the total) cast some doubts on this official Soviet definition of grand and petty cabotage. The traffic between the Black and Azov Seas, as well as that between different seas of the Arctic Ocean, is probably classified as petty cabotage. The problem of estimating the breakdown of total maritime traffic between petty and grand cabotage, as well as local traffic, is indicated in Table B-2.

Inspecting the average length of haul in part C of Table B-2, we find an upward bias in the series by origination in 1935. The ratio of the origination series to that for "terminated trips" in that year was 1.072 for both petty and grand cabotage. Applying these ratios to the average length of haul for "terminating trips" (Table B-2, cols. C-5 and C-6), we may estimate the average length of haul by origination (Table B-3).

TABLE B-3

ESTIMATED AVERAGE LENGTH OF HAUL, DOMESTIC MARITIME TRAFFIC, 1913, 1928-35
(kilometers)

| | By Origination | | | By "Terminated Trips" | | |
|------|----------------|--------------|--------------|-----------------------|--------------|--------------|
| | Petty (1) | Grand (2) | Local (3) | Petty (4) | Grand (5) | Local (6) |
| 1913 | [600] | [13,186] | n.a. | [560] | [12,300] | n.a. |
| 1928 | [622] | [13,936] | [100] | [580] | [13,000] | n.a. |
| 1929 | 629 | 14,289 | [100] | 587 | 13,329 | n.a. |
| 1930 | [621] | [13,922] | [105] | [579] | [12,987] | n.a. |
| 1931 | [612] | [13,557] | [110] | [571] | [12,646] | n.a. |
| 1932 | 604 | 13,191 | [115] | 563 | 12,305 | n.a. |
| 1933 | 669 | 17,602 | 120 | 624 | 16,420 | n.a. |
| 1934 | 678 | 10,737 | 124 | 632 | 10,016 | n.a. |
| 1935 | 671 | 12,951 | 137 | 626 | 12,079 | n.a. |

SOURCE

Col. 1, 1913, 1928-34: Based on col. 4 and ratio of col. 1 to col. 4 in 1935.

Col. 2, 1913, 1928-34: Based on col. 5 and ratio of col. 1 to col. 5 in 1935.

Cols. 1 and 2, 1935, col. 3, 1933-35: Table B-2.

Col. 3, 1928-32: Assumed.

Cols. 4 and 5, 1913: Estimated from 1932 ALH since the distribution of tons originated between petty and grand cabotage in 1913 most closely approached that of 1932.

Cols. 4 and 5, 1928: Extrapolated.

Cols. 4 and 5, 1929, 1932-35: 65, 480.

Cols. 4 and 5, 1930-31: Interpolated.

The volume of local traffic originated can be taken as the difference between the two series given in Table B-4.

APPENDIX B

TABLE B-4

LOCAL MARITIME TRAFFIC, 1913, 1928-35
(thousand tons originated)

| | <i>Total Maritime Traffic Carried in Soviet Bottoms</i> | | |
|------|---|-----------------|---------------|
| | Including Local | Excluding Local | Local Traffic |
| | Traffic (1) | Traffic (2) | |
| 1913 | n.a. | n.a. | n.a. |
| 1928 | n.a. | n.a. | [200] |
| 1929 | 9,100 | 8,839 | 261 |
| 1930 | 12,400 | 12,278 | 122 |
| 1931 | 15,000 | 14,627 | 373 |
| 1932 | 15,100 | 14,820 | 280 |
| 1933 | 16,200 | 16,129 | 261 |
| 1934 | 22,600 | 22,587 | 402 |
| 1935 | 26,100 | 26,102 | 747 |

SOURCE

Col. 1, 1929-35: 82, 1940, No. 9, 3.
Col. 2, 1929-35, col. 3, 1933-35: 42, 6.
Col. 3, 1923: Assumed.
Col. 3, 1929-32: Col. 1 minus col. 2.

Combining the available data with the above estimates, we obtain the total volume of domestic maritime traffic carried in Soviet bottoms (Tables B-5, B-6, B-7, and B-8).

TABLE B-5

PETTY CABOTAGE MARITIME TRAFFIC CARRIED IN SOVIET BOTTOMS, 1913, 1928-35

| | Tons Originated (thousands) (1) | ALH (kilometers) (2) | Ton-Kilometers (millions) (3) |
|------|---------------------------------------|----------------------------|-------------------------------------|
| 1913 | 11,332 | [600] | [6,799] |
| 1928 | 6,602 | [622] | [4,106] |
| 1929 | 7,357 | 629 | 4,628 |
| 1930 | 10,337 | [621] | [6,419] |
| 1931 | 12,665 | [612] | [7,751] |
| 1932 | 12,696 | 604 | 7,668 |
| 1933 | 12,989 | 669 | 8,690 |
| 1934 | 18,523 | 678 | 12,559 |
| 1935 | 20,057 | 671 | 13,455 |

SOURCE

Col. 1, 1913, 1929-35: 42, 6.
Col. 1, 1928: 38, vol. 107, 3f.
Col. 2, 1913, 1928-35: Table B-3.
Col. 3, 1913, 1928-34: Col. 1 times col. 2.
Col. 3, 1935: 42, 6.

APPENDIX B

TABLE B-6

GRAND CABOTAGE MARITIME TRAFFIC CARRIED IN SOVIET BOTTOMS, 1913, 1928-35

| | Tons Originated (thousands) | ALH (kilometers) | Ton-Kilometers (millions) |
|------|--------------------------------|---------------------|------------------------------|
| | (1) | (2) | (3) |
| 1913 | 571 | [13,186] | [7,529] |
| 1928 | 130 | [13,936] | [1,812] |
| 1929 | 119 | 14,289 | 1,700 |
| 1930 | 224 | [13,922] | [3,119] |
| 1931 | 231 | [13,557] | [3,132] |
| 1932 | 415 | 13,191 | 5,474 |
| 1933 | 264 | 17,602 | 4,647 |
| 1934 | 228 | 10,737 | 2,448 |
| 1935 | 122 | 12,951 | 1,580 |

SOURCE

- Col. 1, 1913, 1928-35: 42, 6.
 Col. 1, 1928: 38, vol. 107, 3.
 Col. 2, 1913, 1928-35: Table B-3.
 Col. 3, 1913, 1928-34: Col. 1 times col. 2.
 Col. 3, 1935: 42, 6.

TABLE B-7

LOCAL MARITIME TRAFFIC CARRIED IN SOVIET BOTTOMS, 1913, 1928-35

| | Tons Originated (thousands) | ALH (kilometers) | Ton-Kilometers (millions) |
|------|--------------------------------|---------------------|------------------------------|
| | (1) | (2) | (3) |
| 1913 | n. a. | n. a. | n. a. |
| 1928 | [200] | [100] | [20] |
| 1929 | 261 | [100] | [26] |
| 1930 | 122 | [105] | [13] |
| 1931 | 373 | [110] | [41] |
| 1932 | 280 | [115] | [32] |
| 1933 | 261 | 120 | 31 |
| 1934 | 402 | 124 | 50 |
| 1935 | 747 | 137 | 102 |

SOURCE

- Col. 1: Table B-4.
 Col. 2: Table B-3.
 Col. 3: Col. 1 times col. 2.

A comparison of the ALH for 1932 (984 kms) estimated by the above method and the given ALH (1,035 kms)⁸ suggests that the above estimates are understated. An upward revision of the ALH by 5.2 per cent would raise the estimates to those shown in Table B-9.

⁸ 28, 20.

APPENDIX B

TABLE B-8

DOMESTIC MARITIME TRAFFIC CARRIED IN SOVIET BOTTOMS, 1913, 1928-35

| | Tons Originated (thousands) (1) | ALH (kilometers) (2) | Ton-Kilometers (millions) (3) |
|------|---------------------------------------|----------------------------|-------------------------------------|
| 1913 | 11,903 | [1,204] | [14,328] |
| 1928 | [6,932] | [857] | [5,938] |
| 1929 | 7,737 | 821 | 6,354 |
| 1930 | 10,683 | [894] | [9,551] |
| 1931 | 13,269 | [823] | [10,924] |
| 1932 | 13,391 | 984 | 13,174 |
| 1933 | 13,514 | 989 | 13,368 |
| 1934 | 19,153 | 786 | 15,057 |
| 1935 | 20,926 | 723 | 15,137 |

SOURCE

Cols. 1 and 3: Sum of Tables B-5, B-6, and B-7.
Col. 2: Col. 3 divided by col. 1.

TABLE B-9

ADJUSTED DOMESTIC MARITIME TRAFFIC CARRIED IN SOVIET BOTTOMS, 1913, 1928-35

| | Tons Originated (thousands) (1) | ALH (kilometers) (2) | Ton-Kilometers (millions) (3) |
|------|---------------------------------------|----------------------------|-------------------------------------|
| 1913 | 11,903 | [1,267] | [15,081] |
| 1928 | [6,932] | [900] | [6,239] |
| 1929 | 7,737 | 862 | 6,669 |
| 1930 | 10,683 | [939] | [10,031] |
| 1931 | 13,269 | [864] | [11,464] |
| 1932 | 13,391 ^a | 1,034.5 | 13,853 ^b |
| 1933 | 13,514 | 1,004 | 13,568 |
| 1934 | 19,153 | 798 | 15,284 |
| 1935 | 20,926 | 723 | 15,137 |

^a A rounded alternative figure of 13.3 million tons originated is given in 28, 20.
^b A rounded alternative figure of 13.8 billion ton-kilometers is given in 28, 20.

SOURCE

Col. 1, 1913, 1928-35: Table B-8.
Col. 2, 1913, 1928-31: ALH in Table B-8 times 1.052.
Col. 2, 1932: 28, 20.
Col. 2, 1933: ALH in Table B-8 times 1.03.
Col. 2, 1934: ALH in Table B-8 times 1.015.
Cols. 2 and 3, 1935: Table B-8.
Col. 3, 1913, 1928-34: Col. 1 times col. 2.

An alternative method of estimating total maritime traffic would be to take the ratio of total ton-kilometers, including foreign trade, by origination to that by "terminated trips" given in Table B-1, and apply it to estimated domestic ton-kilometers "by terminated trips." However, neither this nor the ratio between the average length of

APPENDIX B

hauls was stable enough over the period to make such a procedure seem preferable to developing a domestic ton-kilometers series based on tons originated.

THE PERIOD SINCE WORLD WAR II

The official Soviet series for maritime freight traffic since World War II covers all Soviet movements, including those to and from non-Soviet ports, but only those in Soviet vessels. No attempt is made here to estimate the volume of traffic between Soviet ports carried in foreign ships. However, data have been released that enable us to estimate domestic maritime traffic, which is done in the following paragraphs. The procedure involves ignoring the local and grand cabotage components of domestic maritime traffic, in the absence of evidence, and concentrating on the petty cabotage component, which in any case makes up the bulk of the category we are interested in.

The transportation handbook (70, 100) supplies data in tons for dry freight in petty cabotage, by year, for 1946-56. To this must be added "timber and firewood in rafts" (available in *ibid.*, 97), and tanker freight. Unfortunately the series for tanker freight covers grand cabotage and foreign traffic as well as petty cabotage. Nevertheless geography can aid us. Most petty cabotage tanker freight is petroleum moving on the Caspian Sea; these shipments far outweigh the movements from Batumi to Odessa on the Black Sea, and other coastwise movements in the Black Sea, Baltic Sea, far northern waters, or the Sakhalin area. The handbook gives data (*ibid.*, 107) for tons originated of petroleum and petroleum products, by republic, for 1950 and 1955; Caspian Sea traffic involves the Azerbaidzhan SSR and the Turkmen SSR. Adding these two together accounts for 63.9 per cent of total USSR maritime petroleum-and-petroleum-product tons originated in 1950, and 52.6 per cent of them in 1955. The tonnage involved was 10.1 million in 1950 and 12.1 in 1955, while total USSR oil originations rose from 15.8 to 23.0 million tons. Estimates for Caspian Sea oil originations during the intervening years of 1951-54 can be inserted roughly in proportion to year-to-year trends in the national total (which changed very little from 1953 to 1954).

For the period from 1945 to 1950, an additional clue can be employed, by assuming that the rise in Caspian Sea oil originations was proportionate to the rise in crude oil production in Azerbaidzhan and the Turkmen SSR (available in 53, 155). On this assumption, 1945 Caspian Sea oil originations were 64.6 per cent of national

APPENDIX B

maritime oil originations, as compared to 63.9 per cent in 1950. For the intervening years, 1946-49, one can let this ratio decline evenly and estimate the Caspian Sea figures from the national figures for maritime oil originations. Similarly, for 1956 one can assume that Caspian Sea oil originations rose over 1955 in the same proportion that Azerbaidzhan and Turkmen crude oil production rose in 1956 over 1955 (see 45, 209). The result of these computations is a continuous series, 1945-56, for estimated petty cabotage tanker originations, which can be combined with the published series for dry and rafted freight to get total petty cabotage maritime tons originated.

The average length of haul for petty cabotage maritime shipments in 1945 was 800 kilometers (given as 799 in 29, 13), and by 1955 it had fallen 15 per cent, to 680 kilometers (10, 132). For the intervening years, 1946-54, an assumption that the average haul fell evenly cannot depart seriously from the facts. We are therefore able to construct Table B-10, dividing total postwar maritime freight traffic into its petty cabotage and "other" components (where "other" includes grand cabotage and local traffic as well as foreign traffic).

TABLE B-10

SOVIET MARITIME FREIGHT TRAFFIC, TOTAL, PETTY CABOTAGE, AND OTHER, 1945-59

| | Tons Originated (millions) | | | Ton-Kilometers (billions) | | | Average Haul (kilometers) | | |
|------|-------------------------------|-------|-------|------------------------------|-------|-------|------------------------------|-------|-------|
| | Total | Petty | Other | Total | Petty | Other | Total | Petty | Other |
| 1945 | 20.2 | 10.9 | 9.3 | 34.3 | 8.7 | 25.6 | 1,698 | 800 | 2,753 |
| 1946 | 20.3 | 11.0 | 9.3 | 29.5 | 8.7 | 20.8 | 1,453 | 790 | 2,237 |
| 1947 | 24.3 | 13.9 | 10.4 | 34.8 | 10.8 | 24.0 | 1,432 | 780 | 2,308 |
| 1948 | 26.9 | 14.8 | 12.1 | 34.8 | 11.4 | 23.4 | 1,294 | 770 | 1,934 |
| 1949 | 30.9 | 18.5 | 12.4 | 37.2 | 14.1 | 23.1 | 1,204 | 760 | 1,863 |
| 1950 | 33.7 | 21.1 | 12.6 | 39.7 | 15.8 | 23.9 | 1,179 | 750 | 1,897 |
| 1951 | 36.5 | 24.0 | 12.5 | 40.4 | 17.8 | 22.6 | 1,107 | 740 | 1,808 |
| 1952 | 41.2 | 27.4 | 13.8 | 44.3 | 19.9 | 24.4 | 1,075 | 725 | 1,768 |
| 1953 | 45.5 | 29.6 | 15.9 | 48.2 | 21.0 | 27.2 | 1,053 | 710 | 1,711 |
| 1954 | 48.5 | 31.1 | 17.4 | 56.7 | 21.6 | 35.1 | 1,169 | 695 | 2,017 |
| 1955 | 53.7 | 34.0 | 19.7 | 68.9 | 23.1 | 45.8 | 1,284 | 680 | 2,325 |
| 1956 | 57.7 | 36.5 | 21.2 | 82.4 | 24.8 | 57.6 | 1,430 | 680 | 2,717 |
| 1957 | 65.7 | | | 92.7 | | | 1,411 | | |
| 1958 | 70.8 | | | 106.3 | | | 1,503 | | |
| 1959 | 73.5 | | | 115.7 | | | 1,574 | | |

SOURCE: Total traffic, from series C-44, C-45, and C-46. Estimates for petty cabotage traffic, explained above. Data for "other" traffic, residuals.

These estimates for petty cabotage traffic understate the volume of domestic maritime traffic in two respects. A portion of the petty

APPENDIX B

cabotage petroleum traffic escapes measurement, and grand cabotage traffic, together with local traffic, remains in the "other" category. Local traffic before the war was small, and may be presumed to cause minor error. Though the volume of grand cabotage traffic appears also to be small, its average haul in 1955 was "over 16,000 kilometers" (10, 132), and therefore even 100,000 tons originated would involve 1.6 billion ton-kilometers of "domestic" traffic excluded from our estimates. Petty cabotage petroleum traffic outside the Caspian Sea may also involve appreciable additional ton-kilometers that should be counted.

Nevertheless, these estimates serve to bring out clearly the divergent trends in domestic and foreign maritime traffic that are masked in the total traffic series. Domestic traffic rose steadily after 1946, in accordance with traffic carried by other carriers and the internal performance of the economy. Foreign traffic, on the other hand, remained generally constant in volume through 1952, and only since Stalin's death has it risen rapidly. The indicated trend accords well with Soviet foreign trade data, and conforms with much other evidence. It will be noted that the average haul for "other" traffic fell from 1945 to 1953, when Soviet policy was "isolationist," and has risen since then (at least through 1956), as the USSR extended its economic relations with the outside world. In spite of the recognized underestimation of domestic traffic associated with the petty cabotage series above, its year-to-year trend is surely a closer indication of the true record than the mixed aggregate represented by the official Soviet series for total maritime traffic.

