

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

Volume Title: Methods for Improving World Transportation Accounts, Applied to 1950-1953

Volume Author/Editor: Herman F. Karreman

Volume Publisher: NBER

Volume ISBN: 0-87014-421-9

Volume URL: <http://www.nber.org/books/karr61-1>

Publication Date: 1961

Chapter Title: Front matter, Methods for Improving World Transportation Accounts, Applied to 1950-1953

Chapter Author: Herman F. Karreman

Chapter URL: <http://www.nber.org/chapters/c2206>

Chapter pages in book: (p. -22 - 0)

Methods for Improving  
World Transportation Accounts,  
Applied to 1950-1953

HERMAN F. KARREMAN

*Princeton University*

*TECHNICAL PAPER 15*

NATIONAL BUREAU OF ECONOMIC RESEARCH

1961

*Copyright © 1961 by*  
NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.,  
261 Madison Avenue, New York 16, N. Y.

*All Rights Reserved*

LIBRARY OF CONGRESS CATALOG CARD NUMBER: 60-53380

PRICE: \$1.50

Printed in the United States of America  
by Quinn & Boden Company, Inc., Rahway, New Jersey

2,005,987

National Bureau of Economic Research, Inc.

**Karreman, Herman F**

**Methods for improving world transportation accounts, applied to 1950-1953. (New York, National Bureau of Economic Research, 1961.**

121 p. 28 cm. (National Bureau of Economic Research. Technical paper 15)

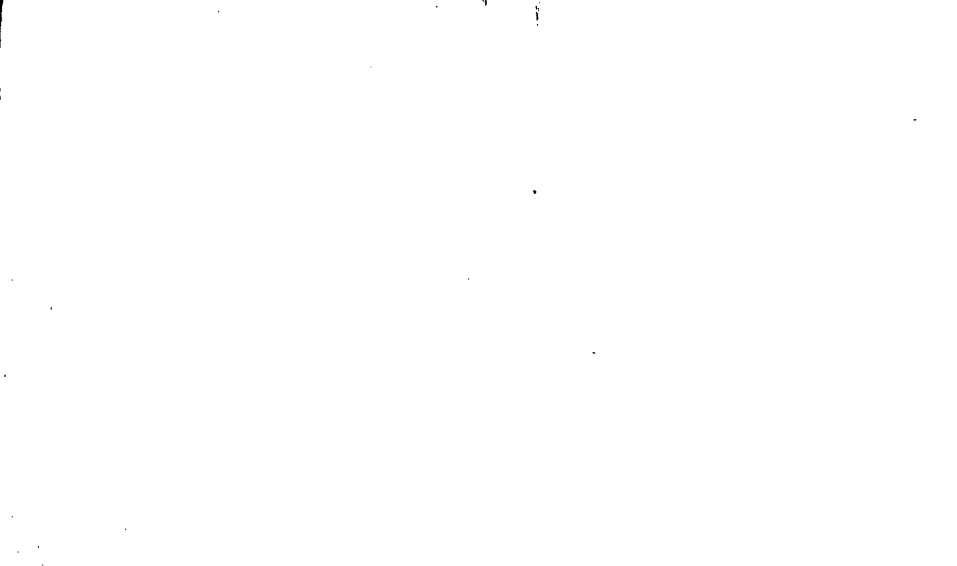
1. Shipping—Accounting. 2. Transportation—Accounting.  
3. Freight and freightage. I. Title.

HE605.K33

657.838

60-53380 1

MATERIAL SUBMITTED BY PUBLISHER.



2,005,987

National Bureau of Economic Research, Inc.

**Karreman, Herman F**

**Methods for improving world transportation accounts,  
applied to 1950-1953. New York, National Bureau of Eco-  
nomic Research, 1961.**

121 p. 23 cm. (National Bureau of Economic Research. Techni-  
cal paper 15)

1. Shipping—Accounting. 2. Transportation—Accounting.  
3. Freight and freightage. 1. Title.

HE605.K33

657.838

60-58880 †

MATERIAL SUBMITTED BY PUBLISHER.



*This report is part of a larger investigation of the structure of world trade and payments conducted with the aid of a grant to the National Bureau from the Ford Foundation. The Foundation, of course, is not to be held responsible for any of the statements made or views expressed.*



# NATIONAL BUREAU OF ECONOMIC RESEARCH

1960

## OFFICERS

George B. Roberts, *Chairman*  
Arthur F. Burns, *President*  
Theodore W. Schultz, *Vice-President*  
Murray Shields, *Treasurer*  
Solomon Fabricant, *Director of Research*  
Geoffrey H. Moore, *Associate Director of Research*  
Hal B. Lary, *Associate Director of Research*  
William J. Carson, *Executive Director*

## DIRECTORS AT LARGE

Wallace J. Campbell, *Nationwide Insurance*  
Solomon Fabricant, *New York University*  
Crawford H. Greenewalt, *E. I. du Pont de Nemours & Company*  
Gabriel Hauge, *Manufacturers Trust Company*  
Albert J. Hettinger, Jr., *Lazard Frères and Company*  
H. W. Laidler, *League for Industrial Democracy*  
Shepard Morgan, *Norfolk, Connecticut*  
George B. Roberts, *Larchmont, New York*  
Harry Scherman, *Book-of-the-Month Club*  
Boris Shishkin, *American Federation of Labor and Congress of Industrial Organizations*  
George Soule, *South Kent, Connecticut*  
J. Raymond Walsh, *New York City*  
Joseph H. Willits, *Armonk, New York*  
Leo Wolman, *Columbia University*  
Donald B. Woodward, *Richardson-Merrell Inc.*  
Theodore O. Yntema, *Ford Motor Company*

## DIRECTORS BY UNIVERSITY APPOINTMENT

V. W. Bladen, <i>Toronto</i>	Gottfried Haberler, <i>Harvard</i>
Arthur F. Burns, <i>Columbia</i>	Walter W. Heller, <i>Minnesota</i>
Lester V. Chandler, <i>Princeton</i>	Maurice W. Lee, <i>North Carolina</i>
Melvin G. de Chazeau, <i>Cornell</i>	Lloyd G. Reynolds, <i>Yale</i>
Frank W. Fetter, <i>Northwestern</i>	Theodore W. Schultz, <i>Chicago</i>
Harold M. Groves, <i>Wisconsin</i>	Willis J. Winn, <i>Pennsylvania</i>

## DIRECTORS BY APPOINTMENT OF OTHER ORGANIZATIONS

Percival F. Brundage, *American Institute of Certified Public Accountants*  
Harold G. Halcrow, *American Farm Economic Association*  
Theodore V. Houser, *Committee for Economic Development*  
S. H. Rutenber, *American Federation of Labor and Congress of Industrial Organizations*  
Murray Shields, *American Management Association*  
Willard L. Thorp, *American Economic Association*  
W. Allen Wallis, *American Statistical Association*  
Harold F. Williamson, *Economic History Association*

## DIRECTORS EMERITI

Oswald W. Knauth, *Beaufort, South Carolina*      N. I. Stone, *New York City*

## RESEARCH STAFF

Moses Abramovitz	Milton Friedman	Ilse Mintz
Gary S. Becker	Raymond W. Goldsmith	Geoffrey H. Moore
William H. Brown, Jr.	Millard Hastay	Roger F. Murray
Gerhard Bry	Daniel M. Holland	Ralph L. Nelson
Arthur F. Burns	Thor Hultgren	G. Warren Nutter
Phillip Cagan	F. Thomas Juster	Richard T. Selden
Joseph W. Conard	C. Harry Kahn	Lawrence H. Seltzer
Morris A. Copeland	John W. Kendrick	Robert P. Shay
Frank G. Dickinson	Simon Kuznets	George J. Stigler
James S. Earley	Hal B. Lary	Norman B. Ture
Richard A. Easterlin	Robert E. Lipsey	Leo Wolman
Solomon Fabricant	Ruth P. Mack	Herbert B. Woolley
	Jacob Mincer	

RELATION OF THE DIRECTORS  
TO THE WORK AND PUBLICATIONS  
OF THE NATIONAL BUREAU OF ECONOMIC RESEARCH

1. The object of the National Bureau of Economic Research is to ascertain and to present to the public important economic facts and their interpretation in a scientific and impartial manner. The Board of Directors is charged with the responsibility of ensuring that the work of the National Bureau is carried on in strict conformity with this object.

2. To this end the Board of Directors shall appoint one or more Directors of Research.

3. The Director or Directors of Research shall submit to the members of the Board, or to its Executive Committee, for their formal adoption, all specific proposals concerning researches to be instituted.

4. No report shall be published until the Director or Directors of Research shall have submitted to the Board a summary drawing attention to the character of the data and their utilization in the report, the nature and treatment of the problems involved, the main conclusions, and such other information as in their opinion would serve to determine the suitability of the report for publication in accordance with the principles of the National Bureau.

5. A copy of any manuscript proposed for publication shall also be submitted to each member of the Board. For each manuscript to be so submitted a special committee shall be appointed by the President, or at his designation by the Executive Director, consisting of three Directors selected as nearly as may be one from each general division of the Board. The names of the special manuscript committee shall be stated to each Director when the summary and report described in paragraph (4) are sent to him. It shall be the duty of each member of the committee to read the manuscript. If each member of the special committee signifies his approval within thirty days, the manuscript may be published. If each member of the special committee has not signified his approval within thirty days of the transmittal of the report and manuscript, the Director of Research shall then notify each member of the Board, requesting approval or disapproval of publication, and thirty additional days shall be granted for this purpose. The manuscript shall then not be published unless at least a majority of the entire Board and a two-thirds majority of those members of the Board who shall have voted on the proposal within the time fixed for the receipt of votes on the publication proposed shall have approved.

6. No manuscript may be published, though approved by each member of the special committee, until forty-five days have elapsed from the transmittal of the summary and report. The interval is allowed for the receipt of any memorandum of dissent or reservation, together with a brief statement of his reasons, that any member may wish to express; and such memorandum of dissent or reservation shall be published with the manuscript if he so desires. Publication does not, however, imply that each member of the Board has read the manuscript, or that either members of the Board in general, or of the special committee, have passed upon its validity in every detail.

7. A copy of this resolution shall, unless otherwise determined by the Board, be printed in each copy of every National Bureau book.

*(Resolution adopted October 25, 1926  
and revised February 6, 1933 and February 24, 1941)*



# Contents

---

	PAGE
ACKNOWLEDGMENTS	xi
FOREWORD BY HERBERT B. WOOLLEY	xiii
INTRODUCTION	1
1. THE EXISTING RECORDS	3
The System of Reporting	3
The Reported Figures	10
2. AMPLIFICATION OF THE RECORDS	13
Freight on Imports	13
Unreported Ship Earnings and Disbursements	27
Tankers Operated by British Oil Companies	28
Ships under Flags of Convenience	31
The Greek Fleet	40
Miscellaneous	42
Receipts from Sales of Fuel Out of Bunkers	42
Port Receipts	43
3. THE AMPLIFIED RECORDS	47
4. TENTATIVE ANALYSIS OF THE RECORDS	56
5. METHODS TO CORRECT FREIGHT PAYMENTS	64
6. METHODS TO CORRECT FREIGHT RECEIPTS	74
Comparison of French Freight Receipts Over Time	75
Comparison of Scandinavian and United States Freight Receipts	76
APPENDIX TABLES	87

# Tables

---

	PAGE
1. System of Reporting Commodities Bought F.O.B. by Finland from United Kingdom and Carried by a Swedish Vessel to Finland	6
2. Commodities Bought C.I.F. by Finland from United Kingdom and Carried by a Swedish Vessel to Finland	7
3. Receipts from All Transportation Items, World Areas, 1951	11
4. Payments for All Transportation Items, World Areas, 1951	12
5. Freight Rates and C.I.F. Unit Values, Actual Freight Factors, and Freight Factor Indexes, 1950-1953	14
6. Estimated Amount of Freight on Imports and Amount as Percentage of C.I.F. Values, 1950-1953	21
7. Comparison of Allocation of Freight on Imports Paid by Denmark with Flag Distribution of Imported Quantities and of Vessels Calling at Danish Ports, 1951	23
8. Comparison of Allocations of Freight on Imports with Flag Distribution of Imports, Australia 1951, Japan 1953	25
9. Freight on Imports Stated but Unallocated by Importing Country, 1950-1953	26
10. Norwegian Tonnages, Receipts and Payments for International Shipping Activities, 1949-1953	33
11. Tonnages, Receipts and Payments of Norwegian Ships, 1949-1953	35
12. Distribution of Fleets under Flags of Convenience, July 1 of 1950-1953	36
13. Average Speed of Tankers, Selected Dates, 1951-1953	36

*Tables*

PAGE

14. Proportionate Share of Tankers Owned by Oil Companies, Selected Dates, 1951-1953	37
15. Tonnages of Fleets Carrying Flags of Panama, Honduras, and Liberia Operated on Voyage and on Time Charter, 1950-1953	38
16. Estimated Receipts and Payments of Fleets Carrying Flags of Panama, Honduras, and Liberia, 1950-1953	39
17. Tonnages of the Greek Fleet Operated on Voyage Charter and on Time Charter, 1950-1953	40
18. Estimated Receipts and Payments of Greek Fleet, 1950-1953	41
19. Port Receipts, Tonnages Entered, and Cargo Delivered and Loaded, Italy and Japan, 1950-1953	45
20. Adjustments in Transportation Figures, 1951	48
21. Comparison of Total Receipts and Total Payments of United Kingdom with Total Payments and Total Receipts of Partner Areas	50
22. Comparison Between Payments and Receipts of All Reporting Countries, 1950-1953	51
23. Comparison of Payments Reported by Partner Areas with Receipts Reported by the Area, 1950-1953	54
24. Comparison of Annual Gross Freight Earnings with Size of Fleets, as of July 1	58
25. Tanker Tonnages and Percentage Proportion in Corresponding Fleets of World Areas, 1950-1953	61
26. Computation of Quantity of Seaborne Dry Cargo Imported by France, 1950-1953	69
27. Computed Freight on Imports of France, 1950-1953	70
28. Computed Freight on Imports of United Kingdom, 1950-1953	72
29. French Fleet Freight Earnings and Port Payments in Foreign Currency, 1950-1953	76
30. Derivation of Average Foreign Trade Freight Earnings of Dry Cargo Vessels Operated by Residents of Norway, Sweden, and Denmark, 1950-1953	78
31. Derivation of Average Foreign Trade Freight Earnings of Dry Cargo Ships Operated by United States Residents, 1950-1953	82

## Appendix Tables

---

	PAGE
A-1. Allocation of Freight on Imports Estimated by NBER, 1950-1953	87
A-2. Freight on Imports, Stated by Country but Allocated by NBER, 1950-1953	95
A-3. Receipts and Payments in Foreign Exchange by United Kingdom for Tanker Operations, 1950-1953	98
A-4. Earnings and Running Expenses of Vessels Flying the Flags of Panama, Honduras, and Liberia, 1950-1953	100
A-5. Earnings and Running Expenses of Greek Fleet, 1950-1953	102
A-6. Estimated Receipts for Sale of Fuel from Bunkers Assumed Not Reported, 1950-1953	104
A-7. Estimated Port Receipts, Assumed Not Reported, 1950-1953	108
A-8. Receipts and Payments, Revised, All Items and All Areas, 1950-1953	110
A-9. Receipts and Payments, Revised, Gross Freight, All Areas, 1950-1953	114
A-10. Receipts and Payments, Revised, Nonfreight Items, All Areas, 1950-1953	118

## Acknowledgments

---

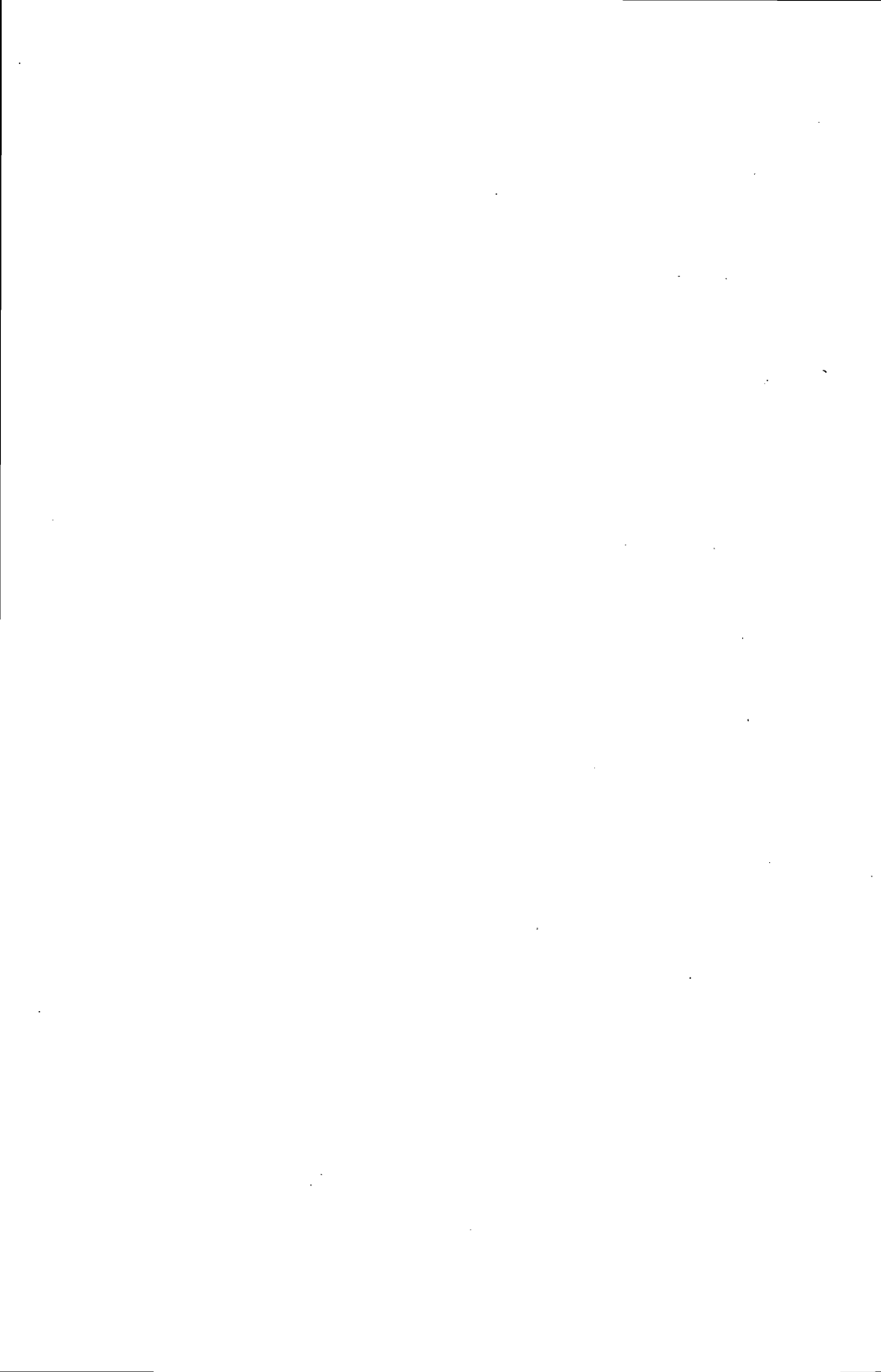
I welcome this opportunity to express my appreciation for the support I received in one form or another from Herbert B. Woolley at various stages of the study. In addition, the results of Cornelius J. Dwyer's study of international petroleum transactions were useful in preparing the section on tankers.

I am indebted to Jon O. Norbom and Robert Stern for their assistance in the more laborious parts of the study, to Walther P. Michael for his precise collection of data from the International Monetary Fund files, and to Carmellah Moneta for performing a good deal of the computations.

The critical comments of Douglass C. North, and in particular those of Thor Hultgren, both of whom reviewed an earlier draft of this paper, proved to be most helpful in preparing the final version of this manuscript. I should like to acknowledge the comments made by the members of the reading committee of the National Bureau's Board of Directors: Melvin G. de Chazeau, Shepard Morgan, and Lloyd G. Reynolds. I am indebted also to Margaret T. Edgar, whose editing improved the readability of this paper.

The first results of this study were given in a paper submitted for discussion to a conference on international economics, called by the Universities-National Bureau Committee for Economic Research, April 1956. An abstract of it appeared with the other papers and abstracts of the conference in the *Review of Economics and Statistics*, February 1958 Supplement.





## Foreword

---

International trade involves more than the exchange of goods valued f.o.b. the frontier of the selling country; in the usual case some expense must be incurred by either the buyer or seller in transporting the goods over water and occasionally overland through third countries. Sometimes the importing country calls for the goods; sometimes the seller delivers, and sometimes vessels operated by residents of third countries or the rail facilities of an inland country like Switzerland will be employed in moving goods between countries. International trade without charges for movement between frontiers is largely confined to trade between contiguous continental countries in Europe and North America. Even a good part of the United States-Canadian trade involves carriage over the Great Lakes, and some trade between contiguous countries on the Continent moves down the Rhine, coastwise, or along inland waterways.

Where the purchasing country provides the transportation between frontiers no international transaction arises. The productive activity is regarded as domestic. However, where the buying country employs the services of residents either in the supplying country or in third countries the purchase of services is as much a part of the international division of labor as the purchase of the goods is. Indeed, some countries specialize in supplying transportation services to other countries: over half of all goods and services credits realized by Greece and nearly half earned by Norway over the five years 1950-1954 were on transportation account. Panama owes its very existence as an independent state to the favorable geographic setting which it affords for transportation, and the hopes of Egypt for betterment have been placed in part upon turning its similar geographic position to better advantage.

Not only may international transactions be required for the carriage of goods traded, but shipping companies serving the world's transit routes also incur a variety of operating expenditures in connection with their business, only some of which may be made at home. Port charges for stevedoring, payments for ships' stores, bunkers, wages of seamen, repairs, and canal fees are important international transactions. Since these are

## Foreword

intimately associated with the movement of goods between countries they, as well as charges for freight, are considered "transportation" transactions.

The whole set of such transactions has a particular meaning: it makes up the internationally exchanged receipts and current expenditures of a single, well-defined, industry—the shipping industry. The services rendered by and to this industry in world commerce represent the largest of the services normally distinguished in international payments accounts, and a larger total of expenditures and receipts than that for any product distinguished in the Standard International Trade Classification three-digit groupings. Indeed, at approximately 10 per cent of world trade over the five years 1950-1954, transportation transactions represented a contribution to world trade about as large as the f.o.b. value of all petroleum moving between countries.

Because of its magnitude and identification with a particular economic activity, an account of the transportation transactions between world areas affords a promising unit for special study. Given such an account, one would have the essential record for describing and analyzing the character of specialization in supplying the most important of all internationally traded services, for the working out of rivalry in competition between supplying areas, for exploring the financial consequences of government policies favoring national shipping industries, and for spelling out the financial impact of disruptions to world trade like that caused by the closure of the Suez Canal in 1956-1957. But where is such a record to be found?

Before we at the National Bureau undertook to compile a record of transactions of different types between world areas, no one had published an account of the transactions between world areas on account of transportation—and for good reason! Such an account cannot be put together by a simple compilation of entries in the published payments accounts of all countries of the world. A compilation, involving the conversion of values from currency units employed in country accounts to a common *numeraire*, is a sizable task for any one year. But intricate accounting problems, related to the ways in which countries account for their merchandise transactions and offshore activities, must be resolved. Such important sections of the world's transportation account as British tanker transactions, transactions of the fleets of Panama, Honduras, and Liberia (PHL), and the Greek fleet are not reported in official accounts; bunkers and port receipts are not always reported; and transactions are not always allocated by partner area. Moreover, most countries of the world maintain trade records with merchandise imports valued c.i.f. and do not distinguish payments for freight.

A reporting country that is small and underdeveloped and lacks the

## Foreword

means of carrying its own goods may find it convenient to draw up its payments accounts with the cost of insurance and freight included as part of merchandise value. No domestic transactions will be included in its record of payments if it carries none of the imported goods, and only a small overstatement of international transactions will usually be involved if it carries some. To maintain balance in its accounts in the latter case, the practice of such countries is to count payments to domestic carriers also as receipts in the shipping account. While payments accounts thus compiled serve a useful purpose in analyzing the international financial position of individual countries, they violate the cardinal principle to be respected in constructing two-valued matrixes of transactions of any given type between world areas, namely: *all transactions of the given type should be shown in the same category by all countries and both the debiting and crediting countries should enter a given transaction in the same category.*

With Walther P. Michael's assistance, in 1954 I undertook a preliminary reconnaissance of the transportation transactions carried in official payments accounts. The resulting "Trial Run Matrix of Transportation Transactions between World Areas in 1951" (NBER, 1954, mimeograph) led to the conclusion that more careful study should be given to transportation. As Americans were poorly versed in European shipping practices, we looked abroad for *expertise* and found it at the Netherlands Central Planning Bureau. Herman F. Karreman was invited to undertake a special study of the world's transportation transactions as part of the more comprehensive study of the structure of world trade and payments being carried on at the National Bureau with aid from the Ford Foundation. This technical paper is the result of that special study.

In setting out on a study of the structure of world trade and payments we have sought to realize statistical, descriptive, and analytical objectives. The statistical objectives were to explore the problems of preparing, with the resources available, the best possible record of international transactions of different types between world areas, to assess the limitations of the data for different purposes, and to prescribe ways to improve the record. The descriptive objectives were to examine the record thus prepared and to observe the economic relationships. The analytical objectives were to employ the record to develop a greater insight into the behavior of the world economy in the past and its likely performance in the future.

Our study of transportation transactions has contributed mainly to realizing objectives of the first two kinds. We have, from Karreman's work reported on in this paper, a full delineation of the problems of setting down a record of transportation transactions between world areas, a contribution of new estimates which notably improve the record, and

## *Foreword*

an indication of ways in which the major remaining deficiencies in the estimation of gross freights might be reduced.

In my further study of transportation transactions employing Karreman's results and also later estimates for the period 1950-1954 (an analysis to be incorporated in the report on the whole study), we have an indication of the limitations of the data for descriptive purposes. Despite the remaining deficiencies in accounting, I find the record usable for some descriptive purposes.

One can gain from the record a considerable insight into the main features of trading in transportation services by world areas and between areas. The broad structure of gross trade in transport services is revealed by the accounts—the concentration of supply, the orientation of particular areas toward certain centers, the comparatively weak position of the United States as a supplier, and the comparative unimportance of most trades between peripheral areas.

We can observe, although imperfectly because of the shortness of the time series, the broad trend of developments over a period of years in the trade in transportation services, reflecting as they do the growth of fleets under different flags. Continental OEEC and PHL fleets show a marked growth, which can be observed in the four years covered by Karreman's study and which continued on into 1954. The growth is reflected in the gain in net transportation trading by the Continent over the years 1950-1954 with all areas and with most partner areas, but particularly with the U.S. The Continent's gain tended to be at the expense of the U.S.

A marked cyclical swing in trade in transportation is apparent in the series I have studied for the five years 1950-1954. The swing for all transportation transactions was more marked than the similar swing in goods trade, and one can observe, particularly for the larger interarea trades, how the general swing in transportation transactions affected particular interarea relationships. The U.S. gained initially from nearly all areas in 1951, the European centers tended to gain from peripheral areas, and the Continent gained from the U.K. The direction of year-to-year change in interarea gross and net trades of transportation are imperfectly recorded by both sides but, with the bias in reporting systematic, the general character of the changes can be observed.

These broad features can be measured to within fairly narrow limits, but not so narrow as for merchandise. The data show a general tendency for transportation payments to be consistently reported in excess of credits acknowledged, a feature seemingly related cyclically to the swing in world confidence associated with the Korean war. There is the suggestion in the figures that the transportation account, particularly of the Continental OEEC countries, provided a major source of leakage in foreign exchange during the early 1950's. An audit of freight payments along

## *Foreword*

the lines Karreman proposes would help establish whether the fault lies with the process of statistical estimation or with the records of exchange controls on the Continent.

It is my observation that errors in the accounts, while sizable, do not render them unusable for describing and measuring the order of magnitude of movements, from year to year and over the five years, in net transportation balances and net transportation balances between areas where the balance is large. Paired records of year-to-year change and change over the five years do not agree so well on the magnitude of change in balance as on the direction of change. But paired records do usually agree on the direction and roughly on the magnitude of the annual balance between areas. The pattern of net balances between world areas has persisted from year to year with little change. The most marked development over the five years has been the growth of the Continental fleet and the improvement of its trading position particularly with the U.S.

These features of the trade in transportation in the years 1950-1954 are not vitiated by the record which must be recognized as being subject to considerable over-all error even after the extensive adjustments made by Karreman. At the same time the two-valued matrix provides a basis for observing at which points the record appears to be particularly deficient. Those using the record in analysis have some indication of the extent of its deficiencies and some indication from Karreman's work as to how some remaining deficiencies might be corrected (see especially Sections 5 and 6).

Whether it is worthwhile for others to undertake the further task of improving the record would depend, of course, upon the analytic uses to which it was to be put. As noted above, our interest has been to develop a serviceable set of accounts for different types of transactions with a view to observing the nature and changing character of specialization in trade between world areas. We have sought with limited resources to develop the best possible record to serve that purpose, and for that purpose, as we have noted, the imperfect record can be used. It can also be useful to obtain indications of the financial consequences of such a disruption to world trade as occurred with the closing of the Suez Canal in 1956-1957. From the pattern of net trade in transportation it seems clear that the burden of higher cost transportation was borne by the peripheral areas that were compelled to pay higher freight costs while, ironically, the North Atlantic centers supplying shipping tended to gain. This much can be inferred from the 1950-1954 record and even more could undoubtedly be said from similar accounts for later years if they were available. A precise measure of the costs and gains from the Suez crisis might be dependent upon a further improvement in the accounts.

HERBERT B. WOOLLEY

*June 1960*

