Volume Title: Transport and the State of Trade in Britain

Volume Author/Editor: Thor Hultgren, assisted by William I. Greenwald

Volume Publisher: NBER

Volume ISBN: 0-87014-442-1

Volume URL: http://www.nber.org/books/hult53-1

Publication Date: 1953

Chapter Title: Front matter, table of contents

Chapter Author: Thor Hultgren, William I. Greenwald

Chapter URL: http://www.nber.org/chapters/c9311

Chapter pages in book: (p. -9 - 0)

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OCCASIONAL PAPER 40

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

1953

Typography by Oscar Leventhal, Inc.
Printing by John N. Jacobson & Son, Inc.

Library of Congress catalog card number: 54-6460

PRICE: $1.50

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

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Foreword

In the concluding chapter of *American Transportation in Prosperity and Depression*[1] Mr. Hultgren set forth the implications of his study for future cycles. If cycles in general business should continue to occur, how would railway, highway, and air traffic react? What changes in the rate of utilization of equipment would take place? How would the productivity of labor in the industry be affected? What changes in costs and profits might be expected? The present paper provides a test of some of Hultgren's answers to these questions — a test based not upon subsequent cycles in the United States, but upon the cyclical behavior of transportation services in another country, Great Britain. Like the previous study, it is devoted largely, though not exclusively, to railway transportation and contains data bearing on secular as well as cyclical developments.

The general course of development of the railroad industry in the United States has been similar in many respects to that in Britain. Railroad construction, of course, began first in England. By 1870, however, the tonnage of freight handled by railroads in the United States began to surpass that handled by railroads in Britain, and the rate of growth in the United States has exceeded that in Britain decade by decade with one significant exception, the decade of the thirties. The number of passengers carried by railroads, on the other hand, has always been considerably larger in Britain, despite its smaller population, and in passenger traffic the percentage rates of growth in the two countries have been more alike than in freight traffic. However, the rates of growth in both types of traffic in both countries have declined rather steadily with the passage of time, exhibiting the retardation so characteristic of the growth of individual industries.

One of the factors contributing to this retardation, especially after

[1] (National Bureau of Economic Research, 1948.)

World War I, was the competition from highway transport. The pressure was particularly severe on railway passenger traffic, as the following percentage changes, 1920-48, indicate. Although railroad freight traffic advanced during this interval, in neither country did it keep pace with industrial production.

	United States	*Great Britain*
	(per cent change)	
Number of passengers	−49	−42
Freight ton-miles	+55	+12
Industrial production	+156	+57

In *American Transportation in Prosperity and Depression* Hultgren made the interesting observation that the diversion of freight traffic from railroads to other transportation agencies took place more rapidly during general business contractions than during business expansions. He now reports a similar result for Britain. Apparently in both countries cyclical contractions have stimulated the shift from rail to truck transport, whether because contraction induces shippers to seek lower costs more energetically or because trucking rates and costs are more flexible in the cycle.

Despite this competitive pressure, which had a similar effect on traffic trends in both countries, it appears that the technological development of British railways has not kept pace with American roads. For example, Hultgren's charts show that during the interwar period the average speed of freight trains rose considerably in the United States, but was virtually constant in Britain. Similarly, traffic per ton of fuel consumed rose in the United States, but stood still in Britain. These differences evidently reflect more rapid adoption of improved equipment by railroads in this country. The net result, to which other factors have also contributed, has been that the amount of labor required per unit of traffic volume is far smaller in the United States than in Britain, and the decline in this requirement in the past thirty years has been far greater in this country. For example, in 1948 railways in the United States carried nearly thirty times as much freight traffic (ton-miles) and nearly twice as much passenger traffic (passenger-miles) as British railways, yet they employed only twice as many men.

Because the present study, like Hultgren's earlier investigation, is focused largely upon the cyclical behavior of costs, the factors affecting

costs, and the resulting effects on profits, its significance reaches beyond the transportation industry. The behavior of costs and profits is basic to our understanding of business cycles, and the voluminous data available for the transportation industry make it a useful testing ground for theories concerning such behavior. As the reader will discover from Hultgren's carefully documented account, summed up in Section 8, the behavior typical of American railroads is also typical, in the main, of British railroads.

For example, he finds that the stock of railway equipment bears no consistent relationship to cyclical variations in railroad traffic or general business activity. True, additions to stock are generally higher in years of high than in years of low activity. Yet in the shorter cycles these additions often behave counter-cyclically, and even in the longer contractions net additions often continue to be made, so that there is no decline in the stock. This seems to be as true for Britain as for the United States.

The present study also supports Hultgren's previous finding that "variable costs" per unit of traffic are inversely related to the volume of traffic. In physical terms, the volume of labor, fuel, or purchased materials does not ordinarily rise or fall in proportion to traffic. Moreover, although prices of these factors tend to rise and fall with railroad traffic and with general business activity, the variations are usually not sufficient to offset the opposite changes in unit physical costs. This, together with a high degree of stability in the prices of railway services, leads to the result that a cyclical expansion in traffic has usually been accompanied by a rise not only in aggregate profits but also a rise in profits per unit of traffic, whereas a contraction brings with it a decline in unit profits as well as aggregate profits.

What is true of the railroad industry is not necessarily true of other industries. The influence of volume of business on unit costs must obviously vary widely from one industry to another, and so must the relative changes in factor prices and finished product prices. Unfortunately, detailed factual studies of the kind Hultgren has made are all too rare. But the patient accumulation of systematic bodies of evidence of this sort is the only way to achieve a secure understanding of the processes that generate business cycles.

GEOFFREY H. MOORE

Acknowledgments

Vera Wantman Kopelman and Johanna Stern patiently and energetically helped assemble the statistics and general information for this paper.

Among the directors and personnel of the National Bureau, Harold Barger, Arthur F. Burns, Louise Cooper, G. A. Elliott, Frank W. Fetter, Millard Hastay, Ruth P. Mack, Geoffrey H. Moore, C. Reinold Noyes, and Harold F. Williamson read manuscript versions of the paper and suggested various improvements in style and substance. C. E. R. Sherrington and E. A. Toneri of the Railway Research Service in London examined a preliminary draft, and the final product has benefitted from their wide acquaintance with the economics and technique of transport as well as their proximity to the British scene. A. W. Currie of the University of Toronto sent me informed and useful comments.

H. Irving Forman's fine draftsmanship is evident in the charts.

The extensive collection of British documents in the Economics Division of the New York Public Library was of great assistance. The New York offices of the British Library of Information and of British and Irish Railways, Inc., were courteously helpful.

Thor Hultgren