

THE UNIVERSITY OF MANITOBA

THE IMPLICATIONS OF THEORETICAL AND
HISTORICAL FACTORS FOR THE USE OF COST IN
CANADIAN RAILWAY REGULATION

by

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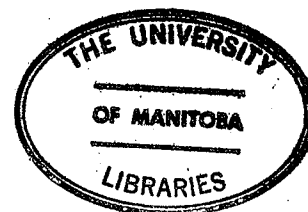
A THESIS

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A dissertation submitted to the Faculty of Graduate Studies of
the University of Manitoba in partial fulfillment of the requirements
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ABSTRACT

The topic of this thesis involves Canadian railway regulation. The argument which the thesis attempts to examine and support is embodied in the hypothesis that "neither economic theory nor the evidence provided by Canadian regulatory experience can be said to justify a scheme of railway regulation whose primary aim is to create or perpetuate a system of rates based on cost."

As the wording of the hypothesis suggests, the thesis is divided into two principal parts, the first dealing with theoretical considerations and the second dealing with historical factors. Both parts are divided into several chapters, each of which is designed to support the central argument.

The first part, that dealing with theoretical matters connected with railway regulation, begins by considering the economic function of transportation in modern society. Subsequently, questions of the economic basis of railway costs and the problems attending their measurement are dealt with. Even with respect to these internalities alone, it is contended that the task of fabricating a cost-based railway rate structure is a complex

and often arbitrary one. Consideration of externalities is likewise pursued. It is contended that the influence of externalities tends further to diminish the desirability of precisely aligning railway rates with calculable internal costs. With a view to further illuminating the complexity of rate determination, the economic implications of this monopolistic-oligopolistic structure of Canada's railway industry are examined. The conclusions obtained from the theoretical questions explored in the first part are that it is neither practical nor desirable to tie railway rates to the conventional commercial concept of cost.

The second part treats a wide range of historical influences which have combined to mould Canadian railway regulation. Five categories of historical influence are explored, namely: military, political and social factors; national and regional development factors; service maintenance factors; carrier finance factors; and structural factors. The examination of all of these categories reveals several factors indifferent or inimical to the creation or use of a system of railway rates based on cost. The operation of these factors is largely responsible for the controversy surrounding the determination and regulation of railway rates in Canada. It is evident that the development of the country's rail system has frequently been incompatible with neo-classical notions of competition and consumer preference. In fact, considerations of "public" or

"national interest" have dominated the formulation of railway policy, including questions of rate regulation. The conclusions obtainable from the second Part therefore also validate the hypothesis.

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TABLE OF CONTENTS

	<u>Page</u>
GENERAL INTRODUCTION	1
PART I	6
CHAPTER	
I. INTRODUCTION.	7
II. MICRO-ECONOMIC THEORY OF TRANSPORTATION - TRANSPORTATION AS AN ECONOMIC PHENOMENON.	10
III. MICRO-ECONOMIC THEORY OF TRANSPORTATION - TRANSPORTATION MARKETS.	20
IV. LOCATION THEORY & THE SPATIAL SIGNIFICANCE OF TRANSPORTATION.	25
V. LOCATION THEORY & TRANSPORTATION COSTS AND RATES	45
VI. SOME TRANSPORTATION IMPLICATIONS OF MACRO-ECONOMIC POLICIES	71
VII. TRANSPORTATION & TECHNOLOGICAL CHANGE	86
VIII. TRANSPORTATION & ECONOMIC PROGRESS.	90
PART II.	115
IX. INTRODUCTION.	116
X. MILITARY, SOCIAL AND POLITICAL ASPECTS.	124
XI. NATIONAL ECONOMIC DEVELOPMENT ASPECTS	181
XII. SERVICE MAINTENANCE ASPECTS	215
XIII. CARRIER FINANCIAL STABILITY ASPECTS	224
XIV. MONOPOLY-OLIGOPOLY ASPECTS.	241

Page

CONCLUSIONS.	275
APPENDIX "A"	279
BIBLIOGRAPHY	281

GENERAL INTRODUCTION

This thesis will examine the economic context of Canadian railway regulation from two points of view, namely the theoretical and the historical. The approach will be, first, to examine, by reference to economic and transportation theory some of the tasks which railway regulation can be expected to undertake and some of the problems it must encounter, and second, in somewhat parallel fashion to examine most of the major regulatory tasks and problems revealed in Canadian railway history. Frequently, throughout this paper, regulatory tasks and problems will be signified by the phrase "purposes of regulation", more in an effort at abbreviation than in an effort at establishing a teleology of railway regulation. The hypothesis which their examination will attempt to explore and test is 'Neither economic theory nor the evidence provided by Canadian regulatory experience can be said to justify a scheme of railway regulation whose primary aim is to create or perpetuate a system of rates based on cost.'

This dual topic is obviously not a narrow one, but it is disciplined by its attention to the significance of cost in those areas of railway regulation concerned or associated

with rates. The regulation of transportation (and, particularly at the national level in this country, railway transportation), is an established fact. It occurs in most advanced countries, Canada being no exception. The transportation system of this nation has experienced regulation in one form or another since before Confederation: regulation not confined to the delineation and enforcement of safety or other technical standards, but having economic content and 'purpose'. The national regulatory apparatus employs large numbers of people. Its activities and decisions regularly occupy the attention of legislators. A considerable body of law supports and defines its functions. Lawyers, consultants, and Royal Commissions devote their activities to studying and attempting to alter it. It is the subject of occasionally bitter political discourse between jurisdictions or areas. An attempt will be made to cast some light on its controversial aspects.

Regulation may be viewed as a function of three elements: first, the institution regulated; second, the institution which regulates; and third, the purposes of regulation. All three of these elements operate simultaneously, but are capable of being analysed individually. Of them, the purposes of regulation could be said to provide the animating force, and the discussion of that category could therefore be used to focus the treatment

of all three elements. Consequently, the identification and understanding of the purposes of Canadian railway regulation is of sufficient independent significance to comprise an important theme of this paper. It is pursued through the medium of an hypothesis whose exploration requires an analytical review of the context of railway regulation in Canada.

Before detailed analysis of the purposes of regulation can begin, an adequate working definition of 'regulation' must be supplied. In the transportation milieu what does the concept of regulation entail? At the most fundamental economic level regulation means legally sanctioned intervention into the workings of an institution for the purpose of securing certain economic results. In the case of transportation the 'institution' in question is the transportation system (which in turn may be defined as the enterprises which undertake the service of moving goods and persons, and the facilities which these enterprises operate) or one of its modal components. The source of the 'legally sanctioned intervention' is the governmental system of the jurisdiction in which the transportation system is situated. The 'economic results' mentioned embrace matters ranging from the structural characteristics of the transportation system to its performance in terms of prices, costs, output, and efficiency. The deliberate use of the word 'intervention' denotes the assumption of a divergence

between the 'economic results' which occur as the goal and presumptive consequence of the political decision to intervene, and the 'economic results' which would otherwise obtain.

The preceding definition is, in the most abbreviated sense, a theory of regulation. One of its central components is the concept of intervention, with its clear implication that the economic results produced by the unregulated transportation system do not satisfy certain standards which are socially determined (presumably but not necessarily under the influence of economic considerations), politically expressed and legally formulated. Without this need for intervention, transportation regulation would have no purpose.

Just as the term 'regulation' required definition, so must the phrase 'purposes of regulation' be further explained. This thesis will rely on a personal and rather flexible interpretation of 'purpose'. This conception of regulatory purpose (i.e. the tasks and problems mentioned above) is neither narrow nor strictly literal. Its scope embraces not only the explicit purposes of regulation (e.g. as spelled out in statutes or official policy announcements) but also those pressures or constraints which have exerted strong enough influence on the environment within which the regulatory system operates to significantly affect that system's goals and/or operations. To use an analogy; some

important regulatory purposes might be no more explicit in regulatory statutes than is the prevention of homicide an explicit purpose of statutes prescribing procedures and penalties in murder cases. Hence to establish a satisfactorily comprehensive set of regulatory purposes, processes of deduction and inference are required. Of equal importance in this quest for comprehensiveness is the necessity of exploring both theoretical and historical matters. This is accomplished by the use and testing of a dual hypothesis.

PART I

CHAPTER I

INTRODUCTION

The formidable array of railway regulatory laws and mechanisms did not arise gratuitously. It evolved in response to socially perceived needs. The purpose of this Part is to examine one important category of reasons for the existence of transportation regulation.

To understand the concept of regulation one must understand not only the workings of the transportation system but also the social, political and legal climate within which it operates. This Part will attempt to satisfy the first of those two requirements, - the requirement to understand the functioning of the transportation system. In so doing it will discuss those aspects of economic theory which bear directly on the regulation of transportation. Specifically the intention will be to explain why the generally accepted theories about the structure and performance of the various components (and especially the railway component) of the transportation system can be said to facilitate or - depending on one's ideological predilections - necessitate the adoption of those public policy measures usually referred to in the

aggregate as regulation.

With its emphasis on the economic theory of transportation this chapter takes the deductive approach to ascertaining the reasons for the regulation of transportation. The theory in question describes the economically significant attributes of the components of the transportation system and the principles according to which it operates.

From the regulator's point of view the theoretical approach confers four advantages. Theory provides fundamental insights into the basic nature of the system whose regulation is being contemplated. Theory can reveal those aspects of the system's performance which warrant intervention. Should intervention be in order theory can suggest the manner in which intervention should occur and its probable consequences. And finally, theory can provide standards to guide the regulatory power and to evaluate its accomplishments.

An understanding of the economic theory of transportation is therefore a considerable aid to a study of transportation regulation. Because its ultimate aim is to make certain statements about regulation, this Part will confine itself to a selective treatment of transportation theory. Both in selection and in interpretation those aspects of the economic theory of transportation which yield insights into regulation will be emphasized. It is to be

hoped that this process of selection will simplify the path toward the desirable understanding of regulation without invalidating (at least on procedural grounds) the conclusions obtained.

The elements of transportation theory which will be considered fall within these categories:

- those which deal with the organization and output of the transportation system;
- those which deal with the relationship between transportation activity and certain other forms of economic activity; and
- those which deal with location theory (which is understood for those purposes to mean the link between economics and geography).

These elements will be explored with a view to ascertaining whether they justify the basing of railway rates on costs. This exploration will constitute the testing of the first segment of the dual hypothesis.

CHAPTER II

MICRO-ECONOMIC THEORY OF TRANSPORTATION - TRANSPORTATION AS AN ECONOMIC PHENOMENON

Conventional economic theory treats transportation activity in much the same way as it treats other forms of economic enterprise. Transportation exists in response to demand. In meeting this demand the transportation system encounters the phenomenon of cost. Demand and cost are reconciled by individual firms through the medium of markets. In the economic sense transportation therefore possesses many characteristics common to other industries considered by micro-economic theory.

The transportation system exists in the form of a network which links the economically active portions of the area served by the system. The function of this system and its network is to provide for the physical transfer of persons and goods between geographic points on the network. The principal active components are transportation enterprises or firms which may be denoted collectively as the transportation industry and by modes as the railroad industry, trucking industry, and so on. Most of the firms operate in markets according to commercial principles and

with commercial goals; much of their revenue (the preponderance if their activities are confined to transportation) is derived from the carriage of goods and persons. For this reason the name "carriers" is often applied to the firms.

In economic terms the output or product of the transportation industry is a service. In their transportation capacity member firms of the industry do not produce physical things, tangible products. Nor do these firms add purely physical attributes to the things they move. They do, however, augment certain desirable attributes of the things moved. The physical transfers performed by transportation enterprises create "space" and "time" utility which accrues to the objects carried over the transportation system.¹ This creation of time and space utility is the essence of the service provided by the transportation system. It occurs, as mentioned, with respect to physical items and goods, but it also occurs with respect to people. In either case, the creation of space and time utility can have commercial value susceptible to determination in markets. People are willing to pay to have their goods or themselves moved between various locations within definite time spans. Transportation service can therefore be consumed directly by people or it can be used

¹R. J. Sampson and M. T. Farris, *Domestic Transportation* (Boston: Houghton Mifflin, 1966), p. 5.

in the capacity of an "intermediate service"² to augment the time and space utility attributes of other products. Either way transportation serves to organize human relationships - on a primarily social level in the former case, and on a primarily economic level in the latter case.³ In either case society and its markets recognize the particular demand for transportation services and devote resources accordingly.

That transportation services can fall into the category of final goods is obvious enough. The idea that transportation may also fall into the category of "intermediate services", however, deserves further attention. The key to understanding the position of transportation as an intermediate service lies in the concept of "derived demand."⁴ This concept revolves around the proposition that the demand for a factor of production is ultimately determined by the demand for the final good for whose production the factor in question is used. Interpreted in light of the concept of derived demand, a transportation service can be considered a factor of

²J. B. Lansing, *Transportation and Economic Policy* (New York: Collier-MacMillan, 1966), p. 12. By Lansing's definition on the same page: "that part of the transportation of people which is in connection with their work. . . plus virtually the whole of the transportation of goods are 'intermediate' services."

³Sampson and Farris, *op. cit.*, p. 77.

⁴e.g. P. A. Samuelson and A. Scott, *Economics - An Introductory Analysis* (Toronto: McGraw-Hill, 1966), p. 558.

production whenever the demand for it is derived from the demand for the things transported. The theory that the fundamental significance of the physical transfer of goods lies in adding "time" and "place" utility to those goods possesses merit in two respects. First of all, with its emphasis on 'utility' (a demand - related concept with a high subjective content) it corresponds to the relativist⁵ market - oriented definition of opportunity cost. Secondly, since it is entirely conceivable that - especially in the longer run - "time" and "place" utility can be more economically created (e.g. by changing the location of production) than by using transfer services (within limits, of course), this conception also strengthens the definition of transfer services as a factor of production by suggesting the technological possibilities of substitution (dependent, presumably, on relative costs).⁶

The significance of transportation as an ubiquitous factor of production will be discussed later.

Whether directed to an 'intermediate' or a 'final' role, transportation service, for analytical purposes, can be divided into discrete units. In designation these units frequently describe the accomplishments of the transportation system; designations such as 'ton-miles' or

⁵A characteristic emphasized in Hayek's article, "The Use of Knowledge in Society," *American Economic Review*, September, 1945, pp. 519-530.

⁶Lansing, *op. cit.*, ch. 1.

'passenger-miles' are common.

Similarly, for the purposes of analysis and argument, many elements of the costs incurred by transportation enterprises can be divided into small and discrete units. Other cost elements however, cannot be resolved into small units except by the purely conceptual process of averaging. This is particularly true of railways, an industry characterized by heavy investment in durable capital equipment.

While itself incurring costs the transportation industry produces a service which in turn becomes a cost to many other industries. An understanding of the pervasive concept of cost is therefore central to the understanding of the economic significance of transportation.

What is the fundamental nature of the costs incurred by transportation enterprises? The answer can be found in the fact that the transportation industry, just like other 'productive' segments of the economy, utilises in the performance of its functions 'scarce' factors of production (falling into the general categories of capital, labour, and raw materials) thus effectively precluding the use of such factors by other firms throughout the economy. Hence transportation enterprises are subject to the universal phenomenon of 'opportunity cost'; i.e. the significance of their appropriation of resources lies in the fact that possible alternative employers of such resources are

deprived of the opportunity to use them.⁷

The 'opportunities-forgone' concept of cost deserves elaboration. Insofar as the rules of factor market equilibrium prescribed by conventional micro-economic theory operate, this can be done by examining the market for a single factor of production. Supposing x to be used by many firms in several industries, and each user industry to be in or very close to a state of equilibrium, it is possible to make two major assertions. First, the unit price of x encountered by each firm will be virtually constant; i.e. purchases by any one firm will be in the nature of 'marginal' adjustments, insufficient in quantity to influence the prevailing price. Secondly, for each firm using x , the revenue obtained as a result of the use of a last increment of x (the marginal revenue product of x) equals the price of the incremental unit of x (from the firm's point of view, the marginal cost of x). Assuming the existence of diminishing returns in each of the various production processes employing x , this equality of marginal revenue product and marginal cost is a condition from which any producer firm using x will be loath to depart since "by employing an additional unit of factor x , either the producer can add to his output MP_x , the marginal product of x , whose value to him is the price it will fetch in the

⁷Lansing, *op. cit.*, p. 28.