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## Public Transit Economics and Deregulation Policy

By Joseph Berechman

Amsterdam: Elsevier Science Publishers B.V., 1993

New books on transport economics are seldom put forth by academic publishers. The few that one finds often focus mainly on freight transport with a chapter or two devoted to passenger transport. Recently, changes have occurred with the publication of new texts with substantial focus on the economics of transit operations (Button 1993, Small 1992). Berechman's book reviewed herein is one of the newest additions to this list of books. The objectives of the book are "to conduct theoretical and empirical analyses of the major determinants of . . . the economic structure and conditions of the transit sector," where transit is defined broadly to include intercity passenger transportation and, to "explore and suggest policies which could ameliorate the sector's present crisis and make it economically viable" (page 4).

Berechman accomplishes these objectives in eleven well written chapters that should be easily understood by anyone with some training in econometrics. The clarity of the chapters is commendable and it is not at the expense of adequate presentation of theory. Moreover the level of mathematics does not bore the reader and in each chapter a discussion of theory is always followed by examples of application. From the perspective of both theory and application this book would prove to be one of the finest on transit economics to date. The book is divided into three parts.

Part one examines the economic environment of transit operations starting with a discussion of the factors that explain the evolution and changes in transit demand. These factors include land use, income, car ownership, suburbanization, demography and female employment. Berechman draws upon international data to show that changes in these variables and not in fare and service attributes have contributed to the long term decline of transit. These results are consistent with what

prevails in the transportation literature on the causes of transit decline. While these factors are important and must be understood, it is equally important to recognize that government regulation and subsidization affect transit services supply. Consequently, the author devotes some attention to regulation by focusing on developments in transit regulatory policies, the basic economic rationale for regulation which are often in contrast with the stated goals of governments in regulating public transit, and actual forms of transit regulation. The power of the labor unions, particularly as reflected in pattern bargaining, and subsidies which also affect transit service delivery are discussed. From this discussion Berechman notes that the "combined subsidy and regulatory production environment makes transit a cost-plus industry" (page 84) with most economic rents deriving therefrom accruing to labor and that if allowed most transit firms will engage in unregulated services. Thus, the regulated environment in which most transit firms operate is not acceptable to most of them.

The discussion in part two begins with transit decision making in regulated environments and identifies four different objectives of transit systems that lead to different resource allocation decisions. They are political, managerial or operational, bureaucratic, and cost minimization. Berechman compares these objectives and argues against the political, managerial and bureaucratic objectives and in favor of a cost minimization objectives that includes specific characteristics of the production environment. Despite this argument, Berechman presents a resource allocation model whose objective function is different from cost minimization. Adequate reasons for this change in objective are not provided but one learns later that it is because this objective was used in his earlier work. For consistency, the cost minimization can be maintained without losing much of the generality in terms of conclusions. Besides Berechman's use of this new objective, there are still some inconsistencies in his model specification worth mentioning. In equation (2)

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on page 162, the cost model includes service attributes. However, subsequent equations (7 through 20) are missing this variable. Also, for equation seven to be true (page 228)  $\tau_j$  should be greater than zero which is evident from the first line of footnote 14 on page 245. The third, fifth and tenth lines in this footnote have the wrong sign for the terms affected by the summation signs and are the sources of this error. And, reference is made to equation [8] instead of [7] on page 228.

Part two also surveys studies on transit cost and production structure and concludes that there is excess capacity in transit systems in the short run; there are long run economies when consumed output is used in the cost function; there are constant and decreasing returns to scale when produced output is used; and the optimal fleet size is between 300 and 500. These results assume that a transit system produces one output. When multi-output firms are considered there are increasing returns to density when network is fixed. Additionally, there are increasing returns to output when capital is fixed and economies of scale when capital is allowed to change. For rail operations there are increasing returns to density for smaller systems and diseconomies of scale for larger systems. Additional findings regarding the properties of transit technology are that transit inputs are price inelastic and Cobb-Douglas technology does not characterize transit systems. Furthermore, there are low elasticities of input substitution between capital and fuel and between labor and fuel. Labor and capital are used in fixed proportions according to Berechman.

The results from the cost and production function studies are used as the bases for analyzing transit productivity and efficiency. Here, Berechman distinguishes between technical and allocative efficiency and provides a discussion of performance indicators and partial and total factor productivity. Also, he discusses briefly alternative methods of measuring productivity such as using parametric and non-parametric frontier methods and presents a market equilibrium model of productivity measurement that encompasses the conclusions from the other chapters. Combining the results of the model application with those from earlier studies, he concludes that the principal factors affecting productivity are subsidy, regulation, labor costs, and firm

ownership. This conclusion is consistent with those from the discussion of the factors affecting transit decline.

A minor problem with this part is that the discussion on economies of scope for rail for point-to-point shipment is out of place considering the focus of the book. Another is that an in depth discussion of frontier models is not provided. Since we are beginning to see transit applications of these models more and more (see for example Viton 1986, Chu et al. 1992) and their results may question some of the conclusions from the earlier studies, they are worth a thorough discussion.

Part three begins with a survey of the theories on the causes of regulatory reforms, views on the effect of privatization and deregulation, reform policies, and regimes of regulatory reform policies. Following this discussion, and using the conclusions on the demand and the production characteristics of transit in the earlier chapters, Berechman argues that "it is not certain that genuine contestable markets will emerge following (transit) deregulation" (page 22) for an incumbent monopolistic firm can successfully deter entry under conditions of demand complementarity and network economies. Furthermore, he finds that due to network economies and cost complementarity intra-urban transit markets are more likely to be dominated by few spatial monopolies and inter-urban markets by competitive firms. He argues for continued regulation where there are significant network economies so as to prevent monopolies from evolving.

Berechman continues his analysis by evaluating the international experiences of regulatory reform policies along the dimensions of service level, market structure, externalities, equity and economics. He concludes that regulatory reform does not improve welfare; new and better quality services result from regulatory reform; small areas lose service; fares may rise for intra-city services and lead to lower patronage; and mergers may be observed resulting in a few dominant inter- and intra-city firms. Furthermore, using the experiences of the United States, Berechman argues that competitive tendering results in cost savings that increase with system size due to scale economies. These U.S. experiences are in line with those from Australia and Great Britain, he argues, and also show that the unit cost of

competitive tendering is higher than for negotiated contract in the short term due to the cost of putting the tender together.

Berechman concludes his book by proposing that public agency regulation with tendering is appropriate only for large cities; partial deregulation with tendering is appropriate for small cities, metropolitan areas and rural areas; and full deregulation without tendering is appropriate for intercity transit operations.

The overall evaluation of this book is that it will make an impact on students of transportation. It will be useful particularly in studies of transit cost, productivity and ownership, and it is worth owning a reference copy despite its \$114 price.

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