Research in Transportation Economics 48 (2014) 221–226

Contents lists available at ScienceDirect

Research in Transportation Economics

journal homepage: www.elsevier.com/locate/retrec

A strategy for increased public transport usage – The effects of implementing a welfare maximizing policy

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ARTICLE INFO

Article history:
Available online 11 October 2014

Keywords:
Demand
Supply
Public transport
Price
Fare
Optimization
Welfare
Policy

ABSTRACT

For a long time public transport has experienced a struggle against rising costs and increasing car ownership. So far, public transport appears to be on the losing side in terms of market shares. The aim if this paper is to investigate if a different policy could result in higher public transport usage and improved social welfare. In order to achieve this, a model, explaining public transport usage, public transport supply and costs, is estimated. The model is then used in order to simulate the outcome of an alternative policy of social welfare maximization. It is found that the current policy of the Swedish transport is not efficient in terms of maximizing welfare. In 2011, public transport fares should have been lower in 20 of 21 counties and the supply of vehicle kilometres should have been higher in 17 of 21 counties. Implementing a welfare maximizing policy would have increased the number of trips per capita by 17.2% in 2011 and by an average of 6.7% for the period 1986–2011.

1. Introduction

Transport policy in Sweden, as well as in many countries, states that the transport system should be designed in order to contribute to a shift towards a sustainable society. An important part of the official policy is that pricing in the transport sector should be efficient, i.e. prices should equal marginal costs (including environmental costs caused by transportation) and that changes in the transport system (including investments) should be appraised through the use of cost-benefit analysis. It is also concluded that if the environmental strain caused by the transport system is to be reduced, public transport needs to gain market shares at the expense of the private car. (prop. 2008/09:93) Despite this, the private car has long time gained market shares at the expense of public transport in Sweden as well as in most areas in Europe.

At a strategic level, the primary means of affecting demand at the disposal of the transport supplier is changes in price and service levels. From a policy viewpoint, the balance between fare and service level (in combination with subsidy level) constitutes the fundamental strategic decision. Privately owned producers would probably try to maximize their profits unless regulated. Since public transport in Sweden is publicly controlled and heavily subsidized, the producer's goal should be social welfare maximization. (See e.g. Layard & Walters, 1978 or Zerbe & Dively, 1994 for textbook discussions of welfare theory)[1] The aim of this paper is to evaluate the policy of the Swedish public transport authorities (PTA:s), in terms of fare and supply level, in order to determine if it is efficient, i.e. maximizing the welfare generated from the public transport system. If this is not the case, the paper will also aim at showing what changes such policy would require as well as the results of such policy. The study is of local and regional public transport over which the PTA:s have authority, henceforth in the paper when using the term public transport it refers to local and regional public transport.

The present study uses annual data from 27 Swedish counties from 1986 to 2011. Data are aggregated at a county level. Due to changes in the county structure and missing data, there is a total of 702 usable observations. The data concerning patronage, vehicle-kilometres, costs, and fares are supplied by the Swedish Public Transport Association (Svensk Kollektivtrafik) and Transport Analysis (Trafikanalys) to which local transport authorities report several key statistics. Data on income, population, and car ownership were obtained from Statistics Sweden (SCB).

The next section offers a brief description of the public transport system in Sweden and an overview of the development of public

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[1] For discussions of different management objectives for public transport and their effects, see Bös (1978), Glaister and Collings (1978), Nash (1978), and Webster and Bly (1980).

http://dx.doi.org/10.1016/j.retrec.2014.09.046
0739-8859/

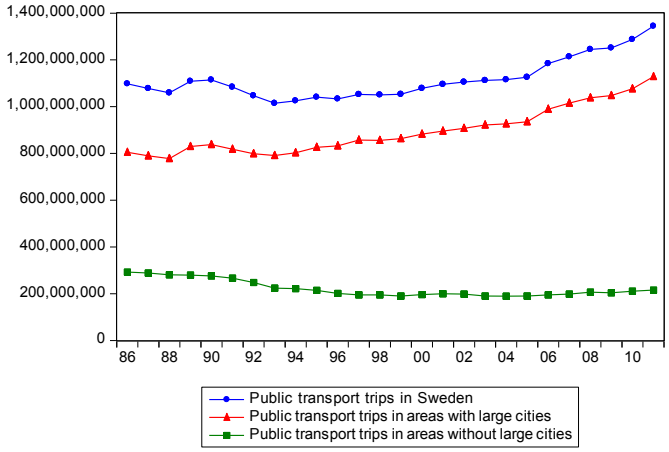

Fig. 1. Number of public transport trips in Sweden 1986–2011. Areas with large cities refer to large cities refer to Stockholm, Västra götaland and Skåne in which the cities Stockholm, Gothenburg and Malmö are situated. Data obtained from the Swedish Public Transport Association and the governmental agency Transport analysis.

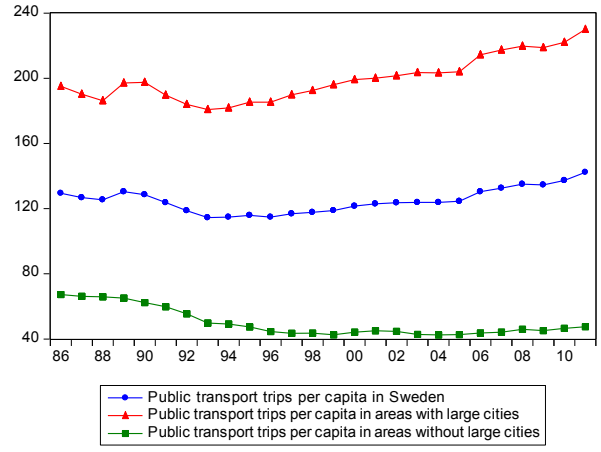

Fig. 2. Public transport trips per capita in Sweden 1986–2011. Areas with large cities refer to large cities refer to Stockholm, Västra götaland and Skåne in which the cities Stockholm, Gothenburg and Malmö are situated. Data obtained from the Swedish Public Transport Association and the governmental agency Transport analysis.

transport in Sweden. In Section 3, a model of the public transport system is presented whilst Section 4 presents the conditions for welfare maximization and implements the empirical results from Section 3 in order to draw conclusions on the optimal fare and supply level. In the last section the results are discussed and conclusions are presented.

2. Development of public transport in Sweden

In 1979 a major organizational reform of the Swedish public transport sector took place. It was a reform that since then has had a profound impact on the workings of the local and regional public transport system. It required a Public Transport Authority (PTA) to be established in each county. The PTA:s are most commonly owned by the municipalities and the county council jointly, and were up to the beginning of 2012 responsible for the coordination of public transport operations in the counties. (Act 1978:438) In 1985 the PTA:s were also given the responsibility of issuing licenses for operating public transport services within the county and in practice it meant that they had the options of (1) performing the services themselves, in house, i.e. acting as an operator themselves or (2) contracting out the service to private companies. In this context, it should be mentioned that before the reform of 1979, public transport services were provided by a mixture of private and publicly owned firms. Before 1960 the sector was dominated by private companies operating without subsidies but increased costs and rising car ownership resulted in many of them being taken over by municipality owned companies during the 1960:s and 1970:s. These companies (including the municipally owned) all operated independently without coordination of fares and service. (Alexandersson, 2010; Jansson & Wallin, 1991).

The most important change 1979 was that the fares was coordinated and subsidized trough the PTA:s. (Alexandersson, 2010; Jansson & Wallin, 1991) After 1985, the PTA:s gradually started to implement competitive tendering of the operations. Since then, the proportion of traffic procured through competitive tendering has levelled out around 95% with some municipalities still operating some special transport services and school transports themselves (Alexandersson, 2010).

Despite relying on private companies to perform the actual operations, the PTA:s has retained all network planning as well as decisions on frequency and fares. They have also regulated what kind of vehicles that should be used and what standard they should have. The operators have worked under gross contracts with no influence over actual operations (Alexandersson, 2010). In terms of Macario (2001) the Swedish system can be characterized as one in which the authorities have almost all influence and initiative and the operators almost none. (See also Hansson, 2011, who discuss the dominant influence of the PTAs in the Swedish system.).

As mentioned before, an important goal of the Swedish transport policy is to increase public transport usage and (some of) the figures presented in Fig. 1 are usually used to claim some success in that regard.

The figure show the number of trips made in local and regional public transport in Sweden 1986–2011. However, as can also be seen in the figure, the positive development is almost totally generated in the three counties containing Sweden's largest cities, i.e. Stockholm, Västra götaland and Skåne (in which the cities Stockholm, Gothenburg and Malmö are situated). Those counties are represented by the middle line in the figure while the lower line shows the development in the rest of Sweden.

Looking at total numbers gives part of the picture as totals might hide the fact that some of the development is due to changes in population and not usage per person. In Fig. 2, the development in local and regional public transport trips per capita is shown. The differences between the large cities and the rest of the country are even more apparent in this case. Outside Stockholm, Västra göraland and Skåne, the number of trips per capita has been falling compared to the eighties. In fact, in 19 of the 27 counties, number of trips per capita reached its peak during 1986–1990 (12 in 1986).

As one of the central policy relevant factors affecting public transport usage, the effect of fare changes has been studied extensively. (e.g. Balcombe et al., 2004; Goodwin, 1992; Holmgren, 2007; Webster & Bly, 1980) From Fig. 3, it can be seen that during the studied period (1986–2011), public transport fares in Sweden have changed quite a lot, even after removing the effects of inflation.[2] In the counties containing the largest cities, real fares (2012 prices) was increased by 68% between 1986 and 2011, while the corresponding figure for the rest of the country was 93%. It is therefore evident that the public transport users in the larger cities as well as outside those areas pay significantly more per trip now than before.

[2] Fares are approximated by revenue per trip. 1 SEK = 0.11€ (July 2013).