Data Article

Modes of transport in the Northeast Corridor: Dataset

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A R T I C L E   I N F O

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A B S T R A C T

These data support the research article: 'The elasticities of passenger transport demand in the Northeast Corridor', Escañuela Romana, I. (2019) [1]. The necessary data were collected in order to be able to estimate a demand model for the different modes of transport between cities in the Northeast Corridor (NEC) of the United States. The data set includes the number of passengers, transport prices, its share within the budget of consumer expenses, for each one of the relevant passenger transportation modes: train, aeroplane, car and coach. The lack of official statistics on the number of passengers and road transport prices is confronted by reconstructing the series from the NEC freeway traffic meters. Such series shall, therefore allow us to estimate a multi-equational demand model in which the conditions of the rational consumer may be added and tested. Without this knowledge, it would not be possible to understand the elasticities and consider the most suitable maximising business strategies and public policies for the wellbeing of consumers.

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1. Data

The data can be found in the attached calculation page: Elasticities_NEC_IER_Rev.xlsx.

The data refer to the different modes of passenger transport in the NEC. They are annual data, from the 2003–2016 period. The variables are: number of passengers, average prices and average share of the consumers' budget. The fundamental characteristics of the transport infrastructures were not modified in said period, and therefore we have an almost homogeneous data series.

First, there is data on railway passenger transport in the NEC. This covers two Amtrak services: Acela and Northeast Regional, that primarily connects Boston, Providence, New York, Philadelphia, Baltimore and Washington DC. The data include the total number of annual passengers and the average annual prices of the service, weighted by the number of passengers. Source: [2,3].

Second, passenger air transport. The routes are: New York-Washington DC, Boston-New York, Boston-Philadelphia and Boston-Washington DC. The data include the annual number of passengers and the average prices per route. From there we can calculate the annual passengers and the average prices weighted by the number of passengers using this mode of transport. Source: Bureau of Transportation Statistics [13]. Method: Random monthly surveys on 10% of all tickets sold in the United States, U.S. DB1A data, U.S. domestic.
Third, data on car and coach transport. In order to calculate the number of passengers who use this transport, the calculation is based on the data available regarding the number of vehicles per freeway. The data are selected based on annual vehicle miles travelled (AVMT) available from the statistical center of the State of Delaware (Highway Statistics, [4]) as well as the AVMT from the statistical department of the State of Maryland (‘HISD Reports’ [5]). In both cases, data are taken from the traffic

Fig. 1. Annual passengers NEC (log).

Fig. 2. Prices passenger transport NEC (log).

Fig. 3. Budget shares.
data of the Interstate Highway 95 (I-95) since it is the primary alternative for trips between cities in the NEC.

The series of prices per car journey can be found in Ref. [9]. These give us different estimations of the cost per mile. In addition, the prices of petrol and by-products can be found in Ref. [11]. Such prices allow us to estimate, in another way, the cost per car and coach journey. The prices per coach journey can be found in Ref. [10].

Fourth, statistics concerning the share of each mode of transport in the cost to the consumer can be found in the BLS, Table 1100 [12]. Detailed tables prior to 2013 need to be requested directly from the BLS.

2. Experiment design, materials and methods

The methodology, the theoretical models and the methods are in Escañuela Romana, I. (2019) [1]. Some calculations are necessary to be able to finally quantify the number of passengers per each mode of transport and the prices of use that they face each year, especially with the following adjustments.

In relation to car and coach transport, the AVMT series must undergo the following adjustments:

- Be divided by the average distance of the journey per freeway in the NEC.
- Be multiplied by the share of cars and coaches within the total amount of traffic circulation in the US [6].
- Be multiplied by the average number of passengers per vehicle, in cars [7] and in coaches [8].

With regard to the costs per journey by cars and coaches, these must be multiplied by the average distance of the journey in the NEC and divided by the average number of passengers per vehicle [7,8]. However, the data series of prices per coach [10] does not cover the entire time series. This can be extrapolated from the increases expressed in the index numbers of the price series of gasoil [11], with an understanding that both entail a high correlation.

Finally, it is necessary to employ a joint quantification of transport per road: adding the number of passengers and calculating a price weighted by the number of passengers of each mode.

In the series concerning the consumers’ budget share, in Table 1100 [12], we distinguish between the costs per consumer for ‘Gasoline and motor oil’ and ‘Gasoline on out-of-town trips’, and ‘Parking fees’ and ‘Parking fees on out-of-town trips’. Moreover, this Table provides data about the expenditure on: ‘Airline fares’, ‘Intercity bus fares’, ‘Intercity train fares’ and ‘Taxi fares and limousine services on trips’. The expenditures on ‘Vehicle purchases (net outlay)’ and ‘Other vehicles expenses’ do not include this distinction concerning out-of-town trips. In this investigation, I calculated the percentage of expenditures on out-of-town trips in relation to expenditures on the entire related set (e.g. Gasoline and others on out-of-trips as a % of Gasoline and others). I then multiple this value by the different expenditures on cars.

The final estimation has been obtained by using R programming language (RFoundation for Statistical Computing) and the software package is “systemfit” (Heningsen & Hamann, 2007) [14]. Finally, the graphic of the data series in napierian logarithms is the following: (see Figs. 1–3).

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Conflict of Interest

The author declares that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.
Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.dib.2019.104977.

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