



The determinants of long distance travel in Great Britain

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ABSTRACT

This study analyses the determinants of long distance travel in Great Britain using data from the 1995–2006 National Travel Surveys (NTSs). The main objective is to determine the effects of socio-economic, demographic and geographic factors on long distance travel. The estimated models express the distance travelled for long distance journeys as a function of income, gender, age, employment status, household characteristics, area of residence, size of municipality, type of residence and length of time living in the area. A time trend is also included to capture common changes in long distance travel over time not included in the explanatory variables. Separate models are estimated for total travel, travel by each of four modes (car, rail, coach and air), travel by five purposes (business, commuting, leisure, holiday and visiting friends and relatives (VFRs)) and two journey lengths (<150 miles and 150+ miles one way), as well as the 35 mode-purpose-distance combinations.

The results show that long distance travel is strongly related to income: air is most income-elastic, followed by rail, car and finally coach. This is the case for most journey purposes and distance bands. Notable is the substantial difference in income elasticities for rail for business/commuting as opposed to holiday/leisure/VFR. In addition, the income elasticity for coach travel is very low, and zero for the majority of purpose-distance bands, suggesting coach travel to be an inferior mode in comparison to car, rail and air. Regarding journey distance, we find that longer distance journeys are more income elastic than shorter journeys.

For total long distance travel, the study indicates that women travel less than men, the elderly less than younger people, the employed and students more than others, those in one adult households more than those in larger households and those in households with children less than those without. Long distance travel is also lowest for individuals living in London and greatest for those in the South West, and increases as the size of the municipality declines.

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1. Introduction

The study presented in this paper is part of a larger project concerned with the prospects for longer distance travel in Great Britain (Dargay, 2010), which was carried out for the Independent Transport Commission. The motivation for the project was twofold. First, long distance travel makes up a substantial proportion of total travel mileage. Although trips of 50 miles or more one-way make up less than 2% of all journeys made by British residents travelling in Great Britain, they account for about 30% of the distance travelled (the study is limited to British residents travelling within Great Britain, so that it does not include foreign travel nor travel to Northern Ireland). In addition, both long distance travel and average trip length have increased over the past decades. It is thus apparent that long distance travel and how it develops in the future will have

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important implications for the environment and for congestion. The second motive is that existing knowledge of long distance travel in Britain is limited. A major aim of the project was to contribute to our understanding of this important travel segment.

The objective of the project was to produce projections for long distance travel by car, rail, coach and air in Great Britain to 2030. The projections are based on a forecasting model which incorporates the effects of economic and demographic factors, policy measures and developments in transport supply. The intention was to develop an aggregate national forecasting model, so that here we are not concerned with geographic differences in travel, or specific origins and destinations. Each of the four modes is broken down into five journey purposes: business, commuting, leisure day trips, visiting friends and relatives (VFRs) and holiday. Since competition between modes is not the same for all distances, the demand for car, rail and coach is further divided into two distance bands: 50 to less than 150 miles, and 150 miles and greater, while air is only considered a relevant mode for trips of 150 miles or more.

The forecasting model is a dynamic, elasticity driven system of 35 demand equations for the four modes by five purposes and two distance bands. For each equation, demand is defined as person miles and is related to travel costs, travel time and the socioeconomic and demographic characteristics of the population by a set of elasticities. Substitution between modes is captured through cross-elasticities for travel costs and time. All elasticities vary by purpose and distance band as well as by mode. The model forecasts travel on a per capita basis and uses population projections to determine total travel.

Various data sources were used to obtain estimates of the parameters in the model. The influence of socio-economic and demographic factors on long distance travel is based on econometric models using the British National Travel Survey (NTS) for the years 1995–2006. This paper presents the results of this analysis.

The structure of the remainder of the paper is as follows. We begin with a discussion of the measurement of long distance travel, describing the methodologies used in various travel surveys and the problems encountered. A brief review of the literature on the determinants of long distance travel follows in Section 3. Section 4 is a descriptive account of long distance travel in Great Britain based on the National Travel Survey. The econometric analysis follows in Section 5: the model specification, the estimation results and a commentary of the findings. A summary of the main determinants of long distance travel and policy implications conclude the paper.

2. Measuring long distance travel

Longer distance journeys are relatively rare events and they therefore present special challenges when it comes to data collection. A paper by Axhausen (2001) provides a review of the methodologies used by various European nations to measure long distance travel during the 1990s. The review shows a great deal of variation in the methodologies and definitions. Some countries used simple postal surveys whilst others used more personal contacts such as telephone and household visits. Fundamentally, even the simple definition of what constituted a long distance journey varied, from between 50 and 100 km, and the recall period over which respondents were asked to record such journeys varied from just 2 weeks to 3 months. Findings from a pilot survey in five European countries allows a number of recommendations on how to best survey long distance journeys, primarily: take a person sample; make an initial telephone contact; follow up with face-to-face interviews; have a retrospective 8 week recall period and apply a 100 km threshold.

Some countries use the same survey to collect short, medium and long distance travel whilst others use a separate survey to collect longer distance journeys. Many European countries adopt the first approach e.g. the British National Travel Survey and the French National Passenger Survey (Madre and Maffre, 2001). In contrast to this approach, the United States uses the American Travel Survey (ATS) to capture longer distance journeys rather than the more general Nationwide Personal Transportation Survey (NPTS) (Bricka, 2001).

On the important matter of memory recall of longer distance journeys, a study that tries to assess the accuracy with which respondents are able to recall journeys made in the past is reported in Denstadli and Lian (1998). From a study of tabulated data, it was found that if the reporting of trips during the first month previous was taken to be the correct level of trip making then the average under reporting in months two and three was substantial at 31%. This level of under reporting was not seen to vary much by purpose, distance, mode or individual mobility. However, longer distance trips were better recalled and amusement trips (e.g. to the theatre or an amusement park) had poorer recall.

A strategy to overcome this underreporting is to develop a methodology that can infer longer distance trip making from knowledge about the most recent long distance journey that the respondent has made. This is the topic of a paper by Richardson and Seethaler (2001) which developed a probabilistic model for an average trip rate multiplier, as a function of the number of days since the long distance trip was made. For a 30 day recall period, the application of a probabilistic multiplier to the most recent trip record was shown to produce average and variability in trip rates close to those from a perfect recall scenario.

From this review it can be seen that there are important issues around how long distance journeys are recorded and that the quality of the data collected may vary according to the methodology used in the survey.

3. Evidence on long distance travel from previous studies

There have been relatively few studies concentrating mainly on long distance travel. Some of these studies have presented evidence based on cross tabulations of important factors whilst others have been based on econometric models.

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