Journal of Transport Geography 61 (2017) 1–8

Contents lists available at ScienceDirect

Journal of Transport Geography

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

Air travel for private purposes. An analysis of airport access, income and environmental concern in Switzerland

Heidi Bruderer Enzler

ETH Zurich, Environmental Research Group, Weinbergstrasse 109, 8092 Zürich, Switzerland

ARTICLE INFO

Keywords:
Air travel
Airport access
Spatial data
Environmental concern
Income
Partisanship

ABSTRACT

As air travel is considered a relevant area of action to mitigate climate change, it is important to know its determinants. The present study examines socio-demographic, spatial and attitudinal predictors of air travel for private purposes. The analyses are based on the *Swiss Environmental Survey 2007* and a subsequent computation of the respondents' environmental impact, as well as spatial data.

A lognormal hurdle model indicates that persons with higher environmental concern are less likely to travel by air and if they still do, they travel less. While political orientations do not affect whether a person travels by air, the results indicate that among those who do fly, respondents voting for the Green Party cause lower emissions than those opting for other left or center parties. Furthermore, higher incomes are associated with more air travel whereas living with children is associated with less air travel. Airport access is related to air travel in the sense that living closer to airports, in particular to large ones, is correlated to more air travel. The result is robust to alterations of the accessibility measure and also upholds when population density is controlled for.

1. Introduction

Over the last decades, air travel has not only altered business and leisure travel but also affected many other aspects of life, such as the range of products available in supermarkets or ways to keep in touch with friends and relatives (e.g. Urry, 2009). Air travel has become an embedded social practice (cf. Budd et al., 2013) so that consumers face a dilemma between following the social norm of being well-traveled and of behaving environmentally responsible (McDonald et al., 2015). Shaw and Thomas (2006, p. 213) conclude that the "idea of taking one or more foreign holidays each year—increasingly to a long-haul destination—has quickly been transformed from an aspiration to an expectation".

Recent studies accordingly underline the notion that tourism constitutes non-essential, highly conspicuous consumption (e.g. Barr et al., 2010; Becken, 2007). For many people, behavior at home and behavior related to holidays appear to be two distinct categories (e.g. Becken, 2007; Dickinson et al., 2010). As is known from other fields of research, behaving morally—here environmentally conscious—in one area may even justify "indulging" oneself in another area without holding back on consumption due to moral reasoning (cf. Merritt et al., 2010). In many qualitative studies, interviewees claim it would not be acceptable to limit their travel and offer a wide range of justifications for flying despite the impact on the climate (e.g. Böhler et al., 2006; Cohen and Higham, 2011; Juvan and Dolnicar, 2014; Kroesen, 2013; McDonald et al., 2015).

Numbers seem to match these descriptions: Global air travel has increased sharply over past decades (The World Bank, 2015) and is projected to increase even further (e.g. Gössling, 2011). Pearce (2014), chief economist at the *International Air Transport Association*, suggests the number of air passengers might even double between 2014 and 2034. This is fundamentally incompatible with current global emissions reduction targets. Already today, a non-negligible amount of greenhouse gas (GHG) emissions is attributed to commercial air travel (approx. 3% of carbon dioxide emissions by human activities, see Budd et al., 2013). Thus air travel is considered a relevant area of action to mitigate climate change.

In this contribution, air travel for private purposes is analyzed using data from the *Swiss Environmental Survey 2007*, a large representative general population study (n = 3313). The analyses are restricted to private purposes, i.e. leisure travel for holidays and visiting friends and family, since the survey did not cover business trips and air travel for private purposes may be related to other variables than business travel. Furthermore, according to the latest Swiss Microcensus on mobility and transport, 78% of all air trips are undertaken for private purposes (Swiss Federal Statistical Office & Swiss Federal Office for Spatial Development, 2012, p. 99). While leisure trips are generally infrequent, their environmental impact is comparatively high due to the distances

E-mail address: bruderer@soz.gess.ethz.ch.

http://dx.doi.org/10.1016/j.jtrangeo.2017.03.014
Received 4 March 2016; Received in revised form 28 January 2017; Accepted 21 March 2017

traveled and the modes of transport chosen.

In the present study, GHG emissions by air travel are estimated by means of life cycle analysis. To account for actual travel opportunities, a measure of airport access is derived from spatial data in combination with airport passenger volumes. The resulting data is analyzed by means of a lognormal hurdle model.

Thus the present study not only features a large representative general population sample but also distinguishes itself from previous work by analyzing a measure of the ecological impact of air travel by means of multivariate inferential statistics, thereby controlling for the effects of a broad range of socio-demographic variables, as opposed to the large number of qualitative studies and cluster analyses on air travel. Furthermore, a measure for travel opportunities is derived from spatial data and analyzed controlling for both socio-economic and attitudinal variables.

2. Previous research

2.1. Income and type of household

Many previous studies on air travel for private purposes have focused on income. The results have been rather unambiguous: the higher the disposable income, the higher the demand for air travel (e.g. Butt and Shaw, 2009; Dargay and Clark, 2012; Holden and Linnerud, 2011; Næss, 2006). For example, in a recent meta-analysis, Gallet and Doucouliagos (2014, p. 153) concluded that the income elasticity of air travel is approximately 1.2 which leads them to describe air travel as a luxury good. Based on a literature review, Wang and Song (2010, p. 43) report that generally "income elasticities tend to be higher for leisure passengers and lower for business passengers". Based on multivariate regression analyses, Reichert and Holz-Rau (2015) confirm the expected correlation between income and the probability of air travel, whereas for those who travel by air, the distance traveled is not related to household income.

The issue of household structure or life stage has often been touched upon but not often been looked into systematically (cf. Davison and Ryley, 2013). Studies frequently report that households with children or larger households in general are less likely to fly than other types of households (e.g. Böhler et al., 2006; Dargay and Clark, 2012; Davison and Ryley, 2013; Næss, 2006). Focus group participants in a study by Davison and Ryley (2013) argued that air travel with children was both expensive, due to the number of travelers involved, and subject to constraints with respect to travel time. Furthermore, families were considered as limited in choice of destination on grounds of particular needs such as child-oriented services or safety. However, Franzen (1998) reports that when customers of a travel agent booking a city trip within Europe have to choose between a trip by train or air, families are more likely to opt for air travel than for a trip by train when controlling for travel costs and time.

Regarding persons who have reached retirement age, many (qualitative) studies agree that this group is less likely to travel by air (e.g. Brand and Preston, 2010). This has been attributed to various reasons such as a feeling of "saturation", but also worse health or the loss of travel companions (e.g. Davison and Ryley, 2013). Yet this may not be true for all retirees as particularly younger retirees have more time and more funds available than during earlier life stages.

Multivariate analyses offer more ambiguous results: Næss (2006) does not find a correlation between being a pensioner and the number of air trips. In contrast, Holz-Rau et al. (2014) report that respondents beyond the age of 70 are less likely to take long-distance leisure trips, and if they do, such trips are shorter (in terms of km) than they are for younger respondents. Regarding age in years, neither Holden and Linnerud (2011), Næss (2006), Reichert and Holz-Rau (2015) nor Franzen (1998) find an effect on leisure air travel.

2.2. Environmental attitudes and political orientation

Previous research—whether qualitative or quantitative in nature—generally indicates that there is no correspondence between air travel and environmental attitudes. Many qualitative studies, cluster analyses or bivariate analyses point to this absence of a relationship (e.g. Barr et al., 2011; Davison and Ryley, 2013; Kroesen, 2013; Lassen, 2010; Ornetzeder et al., 2008; Prillwitz and Barr, 2011). For example, in a focus group study by Hares et al. (2010), participants revealed not thinking about their impact on the climate when planning holidays. The participants in a study by Cohen et al. (2013, p. 990) furthermore distinguish between "home" and "away" and associate being home with acting environmentally friendly, whereas in being away conservation becomes a minor concern. A study by McDonald et al. (2015) indicates that if environmental issues are discussed at all, it is only for short-haul trips. A large representative German survey similarly revealed that environmentally committed respondents were no less likely to have used an airplane for their last holiday trip than other respondents (Kuckartz and Rheingans-Heintze, 2004). However, these studies do not control for factors such as household size or income.

Nevertheless, multivariate analyses by Næss (2006), Holden and Linnerud (2011) and Franzen (1998) confirm the results reported so far. Næss (2006) does not find any relationship between the number of holiday air trips and environmental attitudes. Franzen (1998) did not find any correlation between choice of transport mode for a city trip and environmental concern (controlling for travel costs and time). Holden and Linnerud (2011) did not find a correlation between leisure air travel and general environmental attitudes or membership in an environmental organization; however, the correlation with transport-specific attitudes was positive. The authors offer self-selection as a possible partial explanation in the sense that those who are more interested in "distant cultures" may also be more concerned with global issues such as climate change (p. 2096).

In sum, most of the above studies discussing environmental concern are qualitative or limited to bivariate (and mostly descriptive) analyses. Thus the question remains whether environmental concern might nonetheless be relevant when controlling for other factors.

Regarding political orientation, there has not been very much research notwithstanding an enduring (yet at times polemicizing) presence in the media—for example by focusing on individual politicians or on green voters not living up to green ideals (e.g. Spiegel Online, 2014). However, these publications are based on non-representative samples and simply describe data without controlling for travel purpose (business vs. leisure), income or education.

Previous research generally indicates there may not be any differences in behavior between people of different political orientations. In multivariate regression analyses, Butt and Shaw (2009) did not find any differences between sympathizers of the main British political parties regarding the probability of having used an airplane in the previous 12 months. In their study in the Exeter area, Barr and Prillwitz (2012, p. 805f) report that a cluster of "committed green travelers" who identified themselves most with both the Green Party and the Liberal Democrats, were no less likely to travel by air for longer holidays than other clusters. However, for short stays away up to three nights, there may be a slight shift to using trains instead of air travel. In a study by Franzen (1998), green voters were as likely as others to choose air trips over train travel (controlling for environmental concern).

In the present study, besides environmental concern, indicators of party preference are included to shed some further light on this topic.

2.3. Spatial attributes

Several studies indicate that people living in urban areas may be more likely to travel by air, do so more frequently and also cover larger distances by air than people living in rural areas. For example, Brand and Preston (2010) report higher travel emissions (all modes and