Long-distance buses in Switzerland
An examination of their substitution effects for long-distance travel (50km+)

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Abstract

The main target of this study is to examine the substitution effects of long-distance buses in Switzerland (50km+) and how they will affect mode choice of trains and cars.

The study is based on a two-phase survey. In the first one, we try to capture the respondents' travel behaviour through an online-access-panel, asking them for their journeys inside Switzerland within the last two months. The second phase focusses on their preferences, attitudes and willingness to pay for different means of transport. Given their stated journeys in part one, we construct a stated choice experiment to explore the trade-offs that the respondents make between long-distance modes by varying the number of changes, access/egress and travel times, comfort features and its prices. We will establish if respondents have strong preferences about their options.

Based on the data that we are currently collecting, together with the recent Swiss mobility and transport Microcensus,we will estimate discrete choice models that allow us to calculate demand elasticities for the different modes considered. We will estimate elasticities for different types of origin-destination pairs, trip purposes and socio-demographic characteristics.

1. Introduction

In recent years, long-distance buses have become an increasingly popular mode of transport. The most prominent example in Europe is Flixbus. They offer very low priced coach trips that appeal particularly to young, price-sensitive travelers and tourists. Also, an increasing number of older people take advantage of this offer as travel times are not that important for many of them when choosing their mode of transport. In addition, according to Flixbus one long-distance bus of the latest generation is already eco-friendlier than an average sized car. With regard to Switzerland's neighbouring countries, where long-distance transport markets are almost completely deregulated, the situation concerning national passenger transport cannot be compared to those of the neighbours due to a law that prohibits international companies to transport people within Switzerland ("Kabotageverbot") and concessions issued by the state. However, last year Switzerland granted the first licence to a national bus company to operate three national, publicly accessible bus lines. This raises the question of who is using this service and, if so, how bus supply competes with train or car.

The main target of this study is to examine the substitution effects of long-distance buses in Switzerland (50km+) and how they will affect mode choice of trains and cars.

2. Methodology

In the German speaking countries there has been little interest in the long-distance coach industry, as it served only niche markets: buses for migrant workers or their families were a typical example. In the US and UK, the interest has been higher due to the prominent role of buses in long-distance travel in those countries (e.g. Schwieterman et al., 2007; van de Velde, 2009). Still, they are rarely included in either data collection or mode choice modelling due their small market shares. The Institute for Transport Planning and Systems (IVT) was involved in two of those studies. Laparrent et al. (2013) report the results of a stated choice experiment, which looked at long-distance mode choice in three European countries. Belgiawan et al. (2017) reanalyse the German value of time study data to derive this value for long distance coach travel, and to estimate demand elasticities. This study included coach as an option in its mode choice and route choice experiments. Both studies will be references for the planned work.

The study is based on a two-phase survey. The first part focuses on the behaviour of all long-distance travellers. An online questionnaire will help to capturing the behaviour (socio-demographic variables, attitudes) of commuters, leisure and business travellers in Switzerland. The second part examines their preferences as well as willingness to pay for different modes of transport given some comfort characteristics. Based on these data, we

develop a Stated-Choice-experiment to examine the trade-offs between the different means of long-distance transport (train, bus, and car) and establish whether respondents have strong preferences for certain options when variables like travel time price, comfort feature and/or number of transfers are varied. In addition, we specifically focus on estimating the corresponding demand elasticities between different transport modes and their market shares. We envisage a net sample of 1,000 respondents and we will recruit them in the German- and French-speaking part of Switzerland. That enables us to possibly reveal and discuss differences in the long distance travel behaviour from participants in both regions.

3. Questionnaire and demand models

The structure of the questionnaire in general, but also the style of questions concerning the attitudes and preferences with regard to environmental aspects, the use of various modes and participation in transport as such are based on our experience, the findings of the literature research and analogous to the Swiss questionnaire Microcensus Mobility and Transport. In order to present a choice experiment in the second part that is as realistic as possible, we ask the respondents to indicate typical commuting trips and long-distance journeys within the last two months. However, in order to keep the response burden (time) within reasonable limits, we require detailed answers only for one long-distance journey, broken down by stages (including start and destination, departure and arrival times, purpose of the journey, comfort features, activities during the journey and at the destination, costs, overnight stays, number of passengers).

In a next step, we will geo-reference all trips with Google. For the alternative "long-distance bus", we will use an existing network and develop a fictitious one. While the currently existing network in Switzerland provides three long-distance bus lines (Eurobus), the fictitious network as a possible future scenario will be much denser in terms of space and time. Estimates for the costs, frequencies, travel times and comfort features for this offer rely on values of domestic and/or neighbouring service providers. In analogy to previous IVT studies, we select reference trips between start-destination pairs by purpose, means of transport and distance in order to obtain a representative sample of trips. These reference trips form the basis for the choice situations in our experiment.

Using the collected data together with the Swiss Microcensus Mobility and Transport, we will estimate demand models in the form of discrete choice models (Multinomial Logit, Mixed Logit and Random Regret) and therefore be able to compare the influence of travel time, access and egress, number of transfers, comfort variables and mode frequency. In addition, we can derive the respective elasticities between the modes and the market shares of the

alternatives car, train and long-distance bus from the models. Following the example of the Swiss and German value of time study, we will explore non-linear transformations to identify potential marginal effects for the journey distance and the personal income. With these findings, we will be able to show whether and to what extent the behaviour of rail and bus passengers in Swiss long-distance transport is substitutable.

4. References

Belgiawan, P.F., B. Schmid, I. Dubernet and K.W. Axhausen (2017) Comparison between RUM, RRM variants, and RAM: Swiss SP and RP data sets, paper presented at the *17th Swiss Transport Research Conference*, Ascona, May 2017.

de Lapparent, M., K.W. Axhausen and A. Frei (2013) Long distance mode choice and distributions of values of travel time savings in three European countries, *European Transport*, 53, 1-31.

Schwieterman, J.P., L. Fisher, S. Smith and C. Towles (2007) The return of the intercity bus: The decline and recovery of scheduled services to American Cities: 1960-2007, Working Paper, Chaddick Institute, De Paul University, Chicago.

Van de Velde, D. (2009) Long-distance bus services in Europe: Concessions or free market?, in OECD (ed.) *The Future for Interurban Personal Transport: Bringing Citizens Closer Together*, 263-287, OECD Publishing, Paris.