Danish long distance travel A study of Danish travel behaviour and the role of infrequent travel activities - DTU Orbit (19/08/2019)

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Historically there has been a lack of knowledge with respect to long distance travel. Due to the considerable contribution of long distance travel to total travelled kilometres and the related energy consumption from the transport sector and derived impacts on greenhouse emissions, this is problematic. The average travel distance has steadily increased during the last decades together with the increasing motorisation of daily travel and international aviation. Previously most focus has been on microscopic daily travel activities, but globalisation has, together with changes in price structures and increasing income, emphasised a travel type segment with significant impact on the total level of travelling. International travel has increased its market shares considerably, and the strong relation with income changes suggests a travel type segment of significant importance regarding future travel behaviour and emissions from transportation in particular. ii The work of this thesis is not limited to a distinct definition of long distance travel, but explores long distance travel in a broader context. The analysis applies data from three different travel surveys: The Danish National Travel Survey (TU), the TU overnight survey, and the Danish Tourism Statistics from the Business and Holiday Survey (HBS). This has enabled focus on infrequent travel activities segmented relative to travel purpose, distance threshold, or travelling with overnight stays. At an overall level the thesis has three main objectives: i) to describe and combine empirical knowledge on Danish travel behaviour in relation to long distance travel, ii) to provide information on the troubles and uncertainties related to different travel survey methodologies, and iii) to reveal some of the drivers of long distance travel related to e.g. socio-economic variables. The analysis of Danish travel activities described in the three different travel surveys has outlined detailed information on Danish travel behaviour at an aggregated level during the past two decades. It has above all revealed the significant role of leisure travel. Private travel represents more than 60% of all travelled kilometres by individuals, and almost 25% alone stem from international holiday tourism even though international holiday travels represent only 0.1% of all travel activities. The study of holiday tourism has outlined some apparent trends that are of high relevance when considering future emissions from transportation. Besides the fact that the share of Danish holiday travellers has increased, the characteristics of the holiday activities have changed as well. The number of domestic holiday activities has stayed more or less constant and the growth is mainly observed in international travel and travel by plane in particular. The development in destinations is two-fold, with a substantial growth in destinations outside Europe as well as a significant increase in European weekend holiday activities. These travel activities are furthermore found to be more sensitive to income changes. The analyses of the three travel surveys also contribute to a validation of different survey methodologies and their ability to describe travels, with overnight stays, in a comprehensive way. The comparison of the travel surveys outlines the classical trade-off between sample sizes and survey uncertainties related to tailored retrospective travel surveys. From a three month retrospective survey it is found that travels with overnight stays are underestimated by 11%, but also that a retrospective survey period is necessary to achieve representative samples. The memory loss of respondents is certainly present in a retrospective survey focussing on multiday travel even though travel activities with overnight stays, intuitively iii should be easier to recall than e.g. travelling above a specific distance threshold. The analysis stresses the importance of further targeting the travel activities of interest to reduce the impacts of memory loss or on the contrary to reduce the survey period. In addition to the descriptive statistics and the comparison of different travel surveys presented in part I of this thesis, the thesis includes four studies of travel behaviour presented in paper form in part II. The first paper outlines and exemplifies the presence and magnitude of different survey biases in the Danish National Travel Survey (TU). The study finds that response biases are heterogeneously distributed across the population and that the bias leads to significant overestimation of car ownership and a consequently underestimation of the respective income elasticity. The study evaluates the impact of measurement error and reveals considerable problems in the data collection of income which in this case reduces the income elasticity. The second paper includes all three Danish travel surveys in a study of leisure travel, with an analysis of the income elasticity of this travel segment. Due to the different survey methodologies, the samples of leisure activities describe the whole span from daily leisure travel activities embedded into people’s daily routines to the infrequent holiday activities. The applied model describes the travel distance of leisure travel including the probability of having leisure activities or not. The study finds increasing income elasticities of travelling or not and increasing income elasticities of travel distances as the leisure purposes become less frequently completed activities. This includes larger elasticities for long distance journeys and journeys with an overnight stay. The paper furthermore reveals and analyses differences in travel patterns for different regions in Denmark, and contribute hereby to an understanding of how future changes in location of the population will influence leisure travelling and the length of long distance travel behaviour. The income elasticity of long distance travel is also examined in the third paper. This study is based on the Danish expenditure survey and analyses consumption of plane tickets and travel packages in relation to the consumption on other non-durable goods. This study finds these infrequent travel activities to be somewhat more sensitive to income changes than found from the three travel surveys. The two different studies of income elasticities outline a wide span of income elasticities for leisure travel that varies between 0.1-1.4 when iv measured in terms of travel demand and from 0.2-0.6 when measured in terms of travel distances. The final paper differs from the others as it explores and evaluates the impacts of the Oresund Bridge ten years after its opening. The new bridge resulted in significant changes in travel behaviour that was not as dominated by long distance leisure travel activities as expected, but rather resulted in a considerable integration of daily travel behaviour between the two countries. The financial benefits were compared with the construction and maintenance costs of the bridge in an ex-post cost benefit assessment which suggests that the bridge is a sound socio-economic investment.

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