The market entry of low cost airlines (LCA): Implications for mode choice between Switzerland and Germany

Prof. Dr. Thomas Bieger, IDT-HSG, University of St. Gallen
Dr. Christian Laesser, IDT-HSG, University of St. Gallen

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Prof. Dr. Thomas Bieger
Dr. Christian Laesser
Institute for Public Services and Tourism at the University of St. Gallen
Varnbüelstrasse 19
CH-9000 St. Gallen

Phone: 071-224 25 5
Fax: 071-224 25 36
e-Mail: thomas.bieger@unisg.ch, christian.laesser@unisg.ch

Abstract

This paper is about drivers of mode preferences on medium range travel (500 – 1'000 km), both including a full range of modes.

The past 2 years, a number of low cost airlines (LCA) have entered the Swiss market, targeting at selected routes between Switzerland and Germany. Other than with regard to traffic between Switzerland and the UK, where LCA such as Easyjet and Ryanair have taken market shares from mainly traditional network airlines only (rationale: geography and distance on those routes) or have generated new traffic, travel between Switzerland and Germany has been dominated by car and train. With LCA entering the Swiss market, it can be hypothesised that mode choice on the routes offered by them has substantially changed.

Based on a situational approach (2 situations, characterising the demand side) and a number of actual offerings set up for selected routes (characterising the supply side), the study tries to identify drivers of a stated ranking of preferences, operationalised by an OLS regression of attributes towards the very. The database was generated by a survey in Switzerland and Germany in September 2003 and consists of 1'000 representatively selected persons (500 from each Switzerland and Germany). The 2 situations presented consisted of a trip from Zurich to Berlin (1; incorporating direct means of transport) and from Freiburg i.Br. to Leipzig (2, incorporating means of transport with changes/ transfers necessary along the route.).

The key drivers revealed to be relevant for the ranking of given options are travel time, flexibility, comfort, travel costs and safety. The preference to use LCA is basically raised by the wish to use the least travel time as possible and sympathy towards those new business models (incl. their marketing message).

Keywords

Mode Choice – Lowcost Airlines – situational approach – 4th Swiss Transport Research Conference – STRC 2004 – Monte Verità

1. Introduction/ Rationale

This paper is about drivers of mode preferences with regard to medium range travel (i.e. 500-1'000 km), illustrated on two situational approaches (Zurich – Berlin including direct connections only and Freiburg i. Br. – Leipzig partially including connections wih transfers), taking into account numerous options to travel in general and the role of low cost airlines (LCA) in particular. The paper takes – other than a majority of mode choice papers - a marketing perspective.

The airline industry in Europe is in midst of a fundamental restructuring process. As observed 25 years earlier in the United States (late seventies deregulation), low cost – no frills airlines are driving the entire industry to rethink their business models and approaches to air transport. While in the United States companies such as Southwest have been among the leading companies driving those changes, in Europe it has been Ryanair (founded in 1985, originally operating routes between Ireland and UK and within UK, now within most of Europe) and Easyjet (founded 1995 originally operating from its Luton base, now also expanding rapidly across the entire continent).

New companies have also been established in continental Europe, amongst whose the most prominent are such as Air Berlin (founded in 1979; operating as a low-cost airline since 1998, with their City Shuttle introduced in 2002, based in numerous german cities), Germanwings (a 100% daugther of Eurowings, which is again a daughter of Lufthansa, based in Cologne and Stuttgart), German Express and (newly established) Helvetic (a Switzerland based company just started operations recently). As the effects of deregulation have not deployed yet their full impacts (the European market for instance is still a lot less consolidated than the American one) new market entries can be expected in the near future and finally market exits in the medium to long term future.

The business models of LCA differ themselves profoundly from the ones of traditional network carriers (such as the majority of the "Nationals" within Europe; for a comprehensive view c.f. Bieger, Döring & Laesser 2002; Farkas 1997; Rivera et al. 1997). First, they keep away from high frequented airports using rather peripheral ones with lower landing and parking fees. Second, in-flight service is reduced to the necessary basics (no frills); in most cases passengers have to pay for any additional services besides the pure air transport. Third, distribution costs are comparably low, focusing on internet and call centres, with intermediaries

and thus commission payments excluded in most of the cases. Fourth, most of the LCA offer point-to-point relations, thus not following the logic of network airlines, which basically all operate within a hub-and-spoke framework. Last but not least, turn-around-times are very much limited, with air-use of planes comparably higher. By that approach, the complexity and thus expected costs of failure of the operations system is reduced very much. Not surprisingly, the basis of success for all those LCA then lies in cheaper fares, mainly based on the cost-effectiveness of those companies above described.

The market entry of LCA not only drives changes within the industry itself but also with regard to volume and structure of demand. From a Swiss point of view (i.e. from the perspectives of O&D originating or terminating in Switzerland), two effects on the demand side could be observed: First, the volume of travelling on O&D with offers of LCA has grown significantly, with new forms of traffic having been attracted. Second, changes in modal split in favour of LCA can be observed (Schnitgerhans 1999). The main *local* competitor within the industry – Swiss – not surprisingly has reacted to those changes, introducing low fares on selected routes, too. The most competed routes are such as Zurich to London airports, Berlin, Hamburg, Köln/ Bonn and Geneva to London airports, Amsterdam, Paris and Nice. But also train companies are well aware of the shifts initiated by the market entry of LCA. City Night Line (a Swiss based company offering overnight transport to selected cities in Germany and the Netherlands) for instance has recently introduced SparNight to adequately match potential lost of market shares.

In the past years, the number of transport alternatives for medium range travel (between 500 – 1'000 km) on selected routes has increased correspondingly. The maximum of options consists of car and bus (road), train during day and night (with different classes) and plane (either by means of a network carrier or a LCA). From a Swiss point of view, this maximum of options is offered on the routes between Zurich and Berlin, Hamburg, Cologne and Amsterdam. As different means of non-stop O&D connections exist on those routes, they can serve as a basis for the assessment of stated preferences with regard to mode choice.

As supply structure is ever changing, the research question leading through the paper is as follows: *What attributes can be identified as drivers for ranking mode options for 2 travel situations (O&D): Zurich to Berlin (1) and Freiburg i. Br. to Leipzig (2) and what degree of determination do they have?* On the basis of an OLS regression of numerous attributes towards a stated ranking of preferences with regard to above mentioned trips, this exploratory study tries to identify drivers of mode preferences. The research concept chosen is based on an attitudinal model in general and on the situational approach in particular, originally used by

Hägerstrand (1970) and then further developed (among others) by Brög et al. (1983), Gottardi et al. (1989), or Lu & Pas (1999). Due to a number of constraints (cf. literature review), this present study excludes all non-mode related parameters/ attributes (i.e. socio-demographic background purpose of trips, etc.), thus working with entirely *virtual* travel situations.

2. Literature Review

There is abundant literature on mode choice and preferences for given modes. Basically, 2 research objects groups can be identified:

- (1) freight transport and
- (2) person transport, mainly focusing on mass transit research and medium and long haul travel research.

Further, two approaches can be identified with regard to the 2nd of the above:

- (1) rather taking a (pure) transport research perspective and
- (2) rather taking a (more generalised) travel research perspective.

With regard to research models, two groups can be identified:

- (1) the attitudinal model, including also the situational approach (e.g. Brög 1983) and the planned behaviour approach (e.g. Fishbein & Aizen 1985), and
- (2) choice models, assuming rationality, as a matter of principle (Arrow 1986). Mostly based on an indirect utility approach (= derived utility function under given constraints) (Ben Akiva & Lerman 1985).

Numerous studies show that travel time, travel costs, frequency of service (and therefore flexibility), convenience, reliability and familiarity with a given mode are among the best descriptors for the explanation of preferences with regard to a transport mode (Jara-Diaz & Guevara 2003; Fowkes 2001; Algers et al. 1995; Fowkes et al.1986).

However, a number of relativisations have to be applied. The role of travel time is very much dependant from the rationale of a trip, with business travel being more time-sensitive than leisure travel (Mackie et al. 2003; Hensher 1997). Further, a recent Swiss study shows that when there is a choice of a destination to travel to, mode choice is rather driven by the destination with transport costs not playing a determining role (Laesser 2004). Derived from Fishbein's planned behaviour approach, habit (based on familiarity) seemingly would play another key determining role. However, a recent German study shows that past frequency of mode use does not necessarily produce resistance to goal-related cues to change a given travel mode. Moreover, neither past behaviour or a direct habit measure was able to predict future travel behaviour (Bamberg et al. 2003).

Last but not least, special attention needs to be given though to the differentiation between objectively measured travel parameters and the perception of the very, especially when it comes to (1) costs and (2) travel time. While people's choice is actually based on their perception of travel costs, the modeller estimates the choices "only" using a rational function (for a potentially not rational evaluation; cf. Shifton & Bekor 2002). Second, travel time assessment is also very much driven by perception: Generally, when it comes to modes rarely used, time with regard to travel is generally overestimated; when it comes to modes heavily used, time is rather underestimated (Bamberg 1996; Bamberg & Schmidt 1993; Laesser 1996). Studies further show that under the assumption of cost and time equality the level and quality of service becomes a key driver; according to Ben-Akiva et al. (2002) a bias does arise especially when one supplyer offers a comparably higher quality service.

So, the choice of transport mode proves to be a highly complex decision (Van Middelkoop et al., 2003; Bieger & Laesser 2001). However, due to a number of possible constraints, there are cases where one does not really have a choice when it comes to decision making (Last & Manz 2003; Heggie 1977). Capability (opportunities with regard to activities), coupling (matching of different persons and activities) and authority (legal issues) constraints can reduce the number of options significantly (Hägerstrand 1970). Most studies further show that there are diminishing marginal values of choice parameters, especially when it comes to potential time savings. Additionally, they differ very much among the modes (Mandel et al. 1997).

3. Research plan and method

A written, self-administered survey with 500 representatively (age, profession, education) selected respondents each in Switzerland and Southern Germany (Baden-Württemberg)was conducted in September 2003. At first and with regard to each case, the interviewees were asked to rank order 9 options of travel with 1(first/ best rank) to 9 (last/ least best rank). Based on reconnaissance from a majority of city trips originating in Switzerland (Bieger & Laesser 2002a), the situations presented in which they had to make that choice can be summarised as follows:

- Trip originating in Zurich, lasting at least 2 days/ 1 night in Berlin (present) -> Situation 1
- Trip originating in Freiburg i. Br., lasting 2 days/ 1 night in Leipzig (present) -> Situation 2
- Choice with regard to type of trip (leisure/ business) had to be based on individual background, i.e. if someone primarily was to travel for business reasons, then a business context had to be assumed; a leisure context had to be assumed if someone predominately travelled for private reasons. The representative sample therefore allowed an overall elaboration of preferences.

The mode options put to ranking are presented in tables 1 (Zurich – Berlin) and 2 (Freiburg i. Br. – Leipzig). They represent actual schedules and pricing. Due to data protection, actual companies can not be named at this time and place.

The situations put to question mainly differ with regard to the availability of non-transfer connections. While in situation 1, all means of transport provide non-transfer services, in situation 2 changing between modes is necessary numerous times. So, while situation is specifically in favour of airline connections, situation 2 is set up rather in favour of train connections.

As second step, the respondents were asked to legitimate their choice by indicating the choice-related importance of numerous attributes on a 6 point Likert scale (ranging from 1 = without any meaning to 6 = most important/ decisive meaning). Among those attributes were (direction of action): Travel time (as short as possible), point of time with regard to departure and arrival, punctuality (maximum), flexibility (maximum), costs of transport (minimum), entire travel costs (minimum), travel comfort (maximum), existing possibilities with regard to relaxation, existing possibilities with regard to using travel time productively, stress (mini-

mum), experience (maximum), safety (minimum), security (minimum), sympathy towards a given mode choice (maximum), familiarity with a chosen mode (maximum), ecology (maximum). As in travel practice trip purpose characteristics and socio-economic framework become less delimitable (Bieger & Laesser 2002b), they have been explicitly excluded.

Table 1 Options to rank for travelling from Zurich to Berlin

Mode	Class/ comfort	Departure/ arrival	Price CHF/ EUR
Train (daytime)	2nd	08:02/ 16:02	206/ 137
Train (daytime)	1st	08:02/ 16:02	284/ 189
Train (night-time)	Sleeping coach	19:44/ 07:29	248/ 165
Train (night-time)	Couchette (6 persons)	19:44/ 07:29	298/ 199
Train (night-time)	Sleeper (4 persons)	19:44/ 07:29	348/ 232
Train (night-time)	Sleeper (2 persons)	19:44/ 07:29	422/ 281
Network carrier	Coach/ economy	07:25/ 08:55	494/ 329
Low cost carrier	Standard	12:15/ 14:40	276/ 184
Car (self drive)	According to car	8-9 h driving time	240/ 160

Table 2 Options to rank for travelling from Freiburg i. Br. to Leipzig

Mode	Class/ comfort	Departure/ arrival	Price CHF/ EUR
Train (daytime)	2nd	07:49/ 13:56	189/ 126
Train (daytime)	1st	07:49/ 13:56	316/ 241
Train (night-time)	Sleeping coach	22:03/ 06:28	237/ 158
Train (night-time)	Couchette (6 persons)	22:03/ 06:28	285/ 190
Train (night-time)	Sleeper (4 persons)	22:03/ 06:28	333/ 222
Train (night-time)	Sleeper (2 persons)	22:03/ 06:28	405/ 270
Network carrier (Basel)	Coach/ economy	08:00/ 12:25	720/ 480
Low cost carrier (via Zurich – Berlin)	Standard	10:45/ 16:10	276/ 184
Car (self drive)	According to car	6-7 h driving time	195/ 130

Finally, the values of the attributes were simply regressed (OLS) towards the rank position of a given mode, according to the following specification:

$$R_{Mi} = \beta_0 + \beta_1 A_1 + \beta_2 A_2 + ... + \beta_n A_n + \varepsilon$$

with: β: Constant
A: Attribute
ε: Standard error of estimate

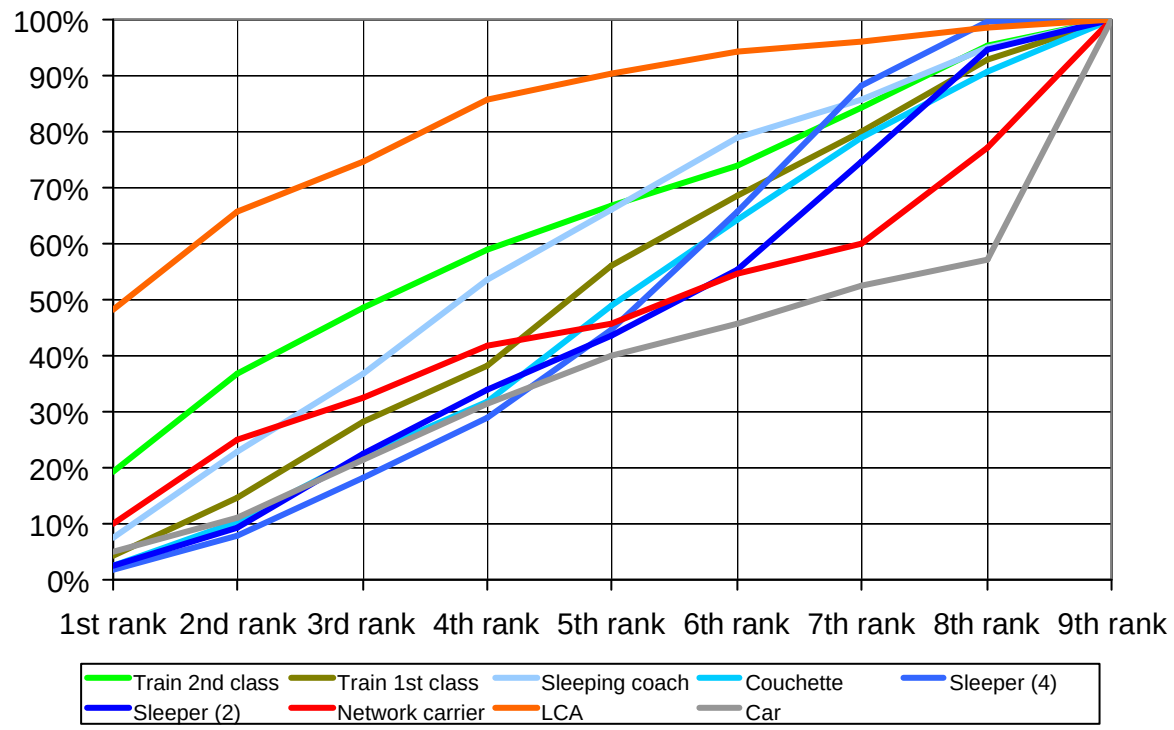
With this setting, rank improvement by growing importance of attribute results in a negative standard coefficient and vice versa. As a result of the exclusion of all non-mode related attributes, a random variable is introduced, representing those deliberately missing travel descriptors.

4. Results and discussion

4.1 Rank order (descriptives)

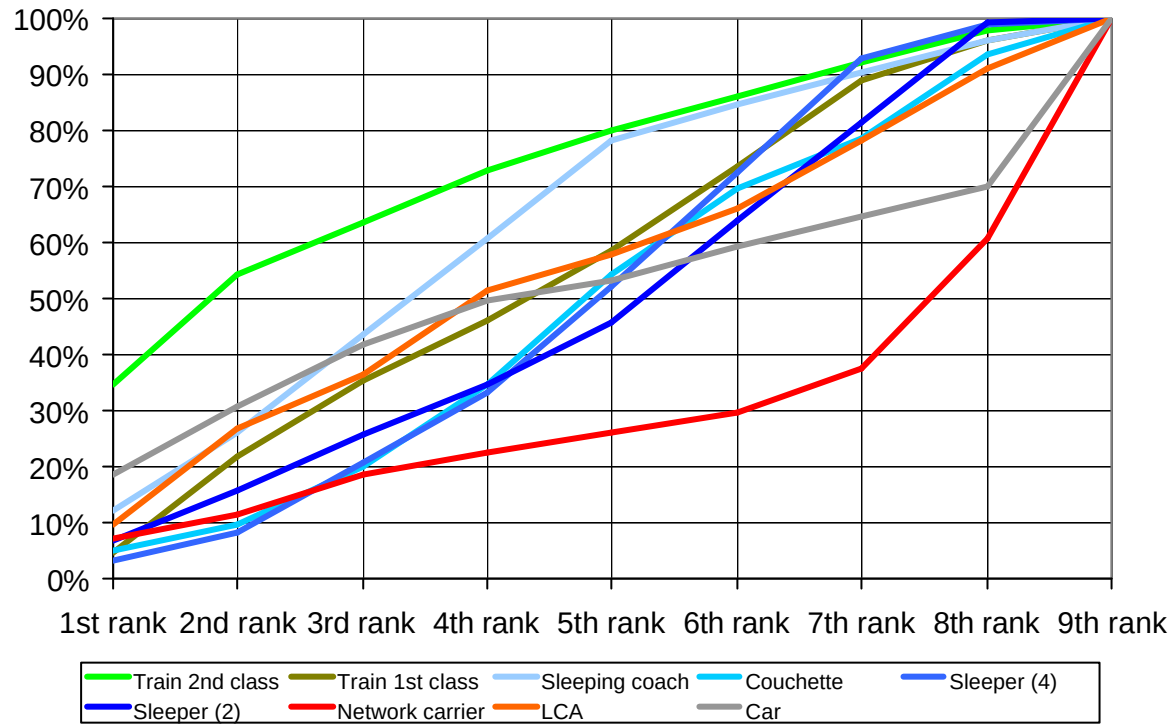
Figures 1 and 2 show the rank orders if mode choice on the O&D Zurich – Berlin and Freiburg i. Br. respectively. With regard to this introductory analyses, the following first conclusions can be drawn:

Figure 1: Rank order of mode choice on the O&D Zurich Berlin



- In the Freiburg – Leipzig case, all train and car connections do have better ranks than in the Zurich – Berlin case. Daytime connections are slightly more favoured than night time connections (probably due to times of departure).
- LCA connections are heavily favoured when feeding and de-feeding efforts to airports (incl. transfer times) are limited. The loss of positions up to 6th rank is more than 30 percentage points (within each position).
- Network carrier connections are used out of habit: The difference in ranking on position 1-3 between the situations is quite small, with increasing loss of position over ranks. Obviously, network carriers are either used generally (if possible) or not at all.

Figure 2: Rank order of mode choice on the O&D Freiburg i. Br. - Leipzig



4.2 OLS coefficients

Table 3 summarises the results of the OLS results for the O&D Zurich – Berlin (situation 1); in Table 4, the results of the O&D Freiburg i.Br. – Leipzig are presented. Comparing the two situation, from the attributes perspectives the following consistent results can be drawn from the two analysis:

Table 3: OLS coefficients for the O&D Zurich – Berlin (situation 1)

	Train 2nd class	Train 1st class	Sleeping coach	Couchette	Sleeper (4)	Sleeper (2)	Network carrier	Low cost airline	Car
Model Fit (adj. R^2)	.500	.452	.422	.399	.308	.389	.624	.454	.423
Std error of estimate	2.319	2.043	2.086	2.009	1.788	2.070	2.342	1.776	2.552
Attributes:									
Travel time	.241**	.175**	.140*	-.114*	-.016	-.022	-.223**	-.391**	.087
Point of time of travel	.077	-.004	-.070	-.049	-.104*	-.065	-.008	.141*	.054
Punctuality	.069	.025	-.053	.022	-.032	-.045	-.089*	.097*	-.013
Flexibility	-.077	.001	.229**	.074	-.013	.015	-.011	-.058	-.109*
Costs of transport	-.144*	.074	-.270**	-.116*	.032	.081	.489**	-.030	-.166*
Costs of entire trip	-.033	-.039	-.084	-.079	.007	.138*	.004	.015	.049
Comfort	.070	-.033	.086	.161*	.001	-.030	-.226**	.007	.010
Opp. w/r to relaxation	.004	-.102*	-.064	-.003	-.042	-.005	-.012	.017	.193**
Opp. w/r to use of time	-.113*	-.146*	-.021	-.012	-.036	-.049	.028	-.025	-.105*
Stress	-.021	-.022	.103*	-.018	-.115*	-.105*	.009	-.091	.157**
Experience	-.063	-.127*	-.077	-.111*	.031	.152**	.075	.130*	-.044
Safety	.164**	-.009	.023	-.050	-.061	-.245**	-.019	.090	.041
Security	-.156*	-.129*	.001	.219*	.180*	.163**	-.014	-.149*	.015
Sympathy	.091	-.041	.009	-.006	.116*	.053	-.068	-.113*	-.164
Familiarity	-.160**	-.127*	.021	.083	.113	.039	.078	.066	-.078*
Ecology	-.131**	.094*	.049	-.140*	-.172	-.054	.065	-.018	.176**

*: α=0.05

** α = 0.01

- **Travel time** clearly is in disfavour of using the train 2nd class but clearly in favour using either network carrier or LCA. Generally when there is less logistical effort with regard to changing modes or transferring within modes, the negative impact of travel sensitivity on the potential use of trains has more determining power.

- **Flexibility** is negatively associated with using sleeping coaches and positively associated with regard to the use of a car.

- **Costs of transports** proves to be the key driver. Sensitivity with that regard generally favours the use of numerous types of trains, while it is negatively associated with

the use of a network carrier. Interesting wise, travel costs prove to be a less important driver with regard to the use of LCA.

- **Comfort sensitivity** generally prevents consumers from choosing couchettes, while it is a positive driver with regard to the choosing of a network carrier.
- The demand for the **use of time** during the trip generally leads to a slight favouring of trains. Apart from that one wonders what the respondents have in mind when it comes to favouring the car when they want to make use of their time...
- The use of the sleeping coach is – as the use of a car - associated with **stress**. Here, actual individual evaluation contradicts the messages of marketing of the train companies.
- The wish to make an **experience** when travelling generally increases the affinity to use a train 1st class, while it decreases the one of LCA.
- **Safety** and **security** are 2 attributes judged on in an ambivalent way. Generally, the wish for safety favours the use of trains, while the wish for security has a contrary effect on the use of that mode.
- **Symapthy** and **familiarity** towards any mode has the most positive impact when it comes to daytime train connections. Conversely, night-time connections are affected rather negatively, i.e. it is rather unlikely for a given customer to develop choice-relevant sympathy towards a that kind of transport.
- The wish to travel **ecologically** sound primarily affects the use of trains 2nd class (positively) and the use of car (negatively).

From a mode perspective, the following key drivers pro or contra a corresponding choice in both situations can be identified (in parenthesis: effect on affinity, with + = sensitivity increases affinity to use this mode; -=vice versa):

- **Train 2nd class:** travel time (-), costs of transport (+), opportunity with regard to use of time (-), familiarity (+), ecology (+)
- **Train 1st class:** experience (+), familiarity (+)
- **Sleeping coach:** flexibility (-), costs of transport (+), stress (-)
- **Couchette:** costs of transport (+), comfort (-), security (-)
- **Sleeper (4):** -
- **Sleeper (2):** safety (+)
- **Network carrier:** travel time (+), costs of transport (-), comfort (+), stress (+)
- **Low cost airline:** travel time (+), experience (-), sympathy (+)

- **Car:** flexibility (+), costs of transport (+), opportunity with regard to the use of time (+), stress (-), ecology +-)

Table 4: OLS coefficients for the O&D Freiburg i.Br. – Leipzig (situation 2)

	Train 2nd class	Train 1st class	Sleeping coach	Couchette	Sleeper (4)	Sleeper (2)	Network carrier	Low cost airline	Car
Model Fit (adj. R^2)	.491	.504	.391	.409	.390	.459	.606	.335	.474
Std error of estimate	2.117	1.940	2.009	1.995	1.712	2.020	2.168	2.504	2.835
Attributes:									
Travel time	.219**	.167	-.017	-.058	.026	.030	-.219**	-.238**	.078
Point of time of travel	-.029	-.111*	-.016	.041	.035	.015	-.088*	.046	.097
Punctuality	.175**	.094	-.108	-.100	-.191**	-.182**	-.037	.061	.059
Flexibility	.068	-.002	.182**	.021	.006	-.054	.050	-.019	-.169**
Costs of transport	-.324**	.070	-.145*	-.162*	.113	.346**	.380**	-.079	-.185**
Costs of entire trip	.295*	.114	-.086	-.096	-.103	-.045	.044	.063	.010
Comfort	.010	-.230**	.223**	.183**	.146*	-.029	-.171**	-.084	.038
Opp. w/r to relaxation	.036	.047	-.167**	-.145*	-.072	-.048	.140*	.082	.091
Opp. w/r to use of time	.114*	.087	.086	.034	-.048	-.087	-.040	-.004	-.131*
Stress	.019	-.020	.107*	-.058	-.075	.102*	-.103*	-.084	.166**
Experience	-.064	-.105*	-.030	.019	.046	.029	-.032	.155*	-.084
Safety	-.095	-.132*	-.079	-.159*	.060	-.183**	.096	-.042	.111
Security	-.002	-.067	.028	.232**	.112	-.092	-.105	-.024	-.042
Sympathy	-.061	-.036	.053	.125*	.187*	.199**	-.094	-.103*	-.086
Familiarity	-.180**	-.118*	.056	.075	.190*	.176*	.056	.067	-.843
Ecology	-.141**	-.005	-.091	-.007	-.115**	-.611	.051	.111*	.194**

*: α=0.05

** α = 0.01

5. Implications and conclusions

The study shows a clear positioning of daytime rail and air transport, with night-time rail service somewhat *in between*. Preference to take a train is positively driven by costs, familiarity and ecological behaviour, while air transport is a matter of reduced travel time and comfort. The preference for taking a LCA is specifically supported by sympathies for those companies; a result which can be very well explained when analysing the marketing measures those airlines take. Very often they are seen as a kind of revolutionary small and therefore nice alternatives to the big national network carriers. Apart from that, they generate options for time sensitive travellers not available for them before: In both situations, the coefficient of the LCA with regard to travel time is higher than the one for the network carrier. Obviously new quick-step travel options are newly available to customers which possibly would not have taken the plane before, with LCA creating new (forms of) traffic. However, effort minimising access to LCA offers (i.e. short transfer, convenient inter-modal exchange) is prerequisite for their success.

The potential preference for night-time rail transport is hampered by the sensitivity of a growing number of people towards issues of comfort. More or less all products available (except the 2 person sleeper) loose ranking positions due to comfort preferences of the respondents. Apart from that, security issues are another negative driver, especially taking into account the ever growing sensitivity with that regard. The preference for the alternative *car* – last but not least – is positively influenced by issues of travel costs (perception!) and flexibility, while with growing ecological concerns, the preference to use this mode declines.

The results of this study support the results of the ones presented in section 2 (Literature Review). However – and other than proposed in earlier studies, the stated values of the attribute *familiarity* at least is positively correlated with the daytime use of trains. In other words: When the respondents think *familiarity*, they mean *familiarity* either with daytime train or car. Obviously and due to less frequented use, customer loyalty with either network carriers or LCA and night-time train offerings seems to be less distinctive. From a marketing point of view (marketing in a comprehensive approach, thus including product development, pricing, promotion and distribution), train companies have to find a customer-retentive substitute for travel time. As already proposed in earlier studies (cf. Bieger & Laesser 2001) and based on the desire to have opportunities with regard to the use of time for relaxation or productive work, the following actions could be taken into account:

- Installation of professional working space;
- Upgrading of seats with in-seat entertainment;
- Newly introduced relax class (including new coaches);
- Focusing on safety and safety image and cleanness.

For Network carriers in general and LCA in particular the marketing implications consist of further improve access to their offers, e.g. by

- introducing official transfer connections (either in co-operation with train or bus companies) and thus possibly enlarge their "official" catchment area (as done for example by Rheintalflug with regular transfer connections to St. Gallen and Voralberg or Lufthansa on the Cologne-Frankfurt leg);
- securing the short check-in check-out procedure at airports;
- rather increase frequencies than introducing new destinations to attract a larger potential of passengers (especially business travellers);
- enable larger number of passengers of changing travel plans, thus increasing flexibility.

Apart from that, closer co-operation between LCA and train companies can be stipulated, mainly with the goal to increase overall available frequencies and thus (inter-modal) options to the traveller (with regard to time, costs and opportunities with regard to the usage of time).

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