Sport consumers' willingness to spend travel minutes

Tim Pawlowski, German Sport University Cologne
Christoph Breuer, German Sport University Cologne
Pamela Wicker, German Sport University Cologne
Sandrine Poupaux, German Sport University Cologne

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The relationship between sport consumption and time was already subject to several studies in different areas of sport economics (e.g. see Cawley, 2004; Késenne & Butzen, 1987; Humphreys & Ruseski, 2006; Taks, Renson & Vanreusel, 1994). In context of sport facility allocation planning, Pawlowski, Breuer and Wicker (2007) could detect that "time to reach the sport facility" is a major factor influencing sport consumption behavior since a short "time to reach the sport facility" affects the consumers' decision in favor of practicing their sport. Therefore, a (1) decentralized sport facility allocation pattern contains efficiency potential by generating a high number of sport participants. Since (2) centralization as well contains efficiency potential (e.g. by economies of scale), efficient sport facility allocation planning is a trade-off decision.

To exhaust the efficiency potential of centrally allocated sport facilities while not restraining a remarkable number of sport consumers from practicing their sport, it is important to know whether sport consumers' willingness to spend additional travel minutes is increasing, decreasing or constant with increasing actual time to reach their sport facility. Applying econometric demand analysis, the objective of this study is to provide a closer insight into sport consumers' "willingness to spend travel minutes".

Regarding sport consumption decisions, theoretically time plays an important role, since consumption activities (e.g. practicing a sport like playing basketball) are produced by means of the input of market goods (e.g. basketball shoes), human capital (e.g. knowledge of tactics,) time (e.g. time to reach the sport facility), and other inputs (e.g. team-mates) (Household Production Theory, see Becker, 1965; Stigler & Becker, 1977). With Humphreys' and Ruseski's (2006) theoretical Model of Participation in Physical Activity, the individual time allocation decision is comprehensively implemented in sport economics.

Regarding the expected impact we can refer to different branches of economic theories that predict similar results. Gossen (1854) was the first to elaborate a general theory of marginal utility (Cardinal Utility Theory). Following his law the marginal utility of goods is diminishing with its increasing consumed number. Therefore consumers' willingness to pay for a good would decrease with increasing consumed quantity of this good. Ordinal Utility economists (e.g. Hicks, 1939) kept on developing Gossens' idea and with Prospect Theory (see Kahneman & Tversky, 1979) the concept as well entered the theoretical branch of Behavioral Economics and Economic Psychology. Following all these theories, marginal utility of leisure is increasing with diminishing disposable leisure, since leisure is a scare good as well (Theory of Labor Supply, see Hicks, 1932). Therefore, if sport consumers are maximizing utility and their behavior is in accordance with economic theory, their willingness to spend an additional time unit should be decreasing with increasing actual time to reach the sport facility.

The relevant data was collected in two of the six biggest German cities with an inquiry among n=5,158 sport service consumers in Cologne and n=3,725 sport service consumers in Stuttgart. Inter alias, we inquire about (a) the time the people need to reach the sport facility of their most practiced sport (CTIME), (b) their maximum willingness to spend if necessary (MWTIME) and (c) different sociodemographic variables.

In a first step we measure the difference (DIFTIME) between MWTIME and CTIME and apply Pearson Correlation Coefficient (r) between DIFTIME and CTIME. We are supposed to find a negative correlation between DIFTIME and CTIME if the "willingness to spend time to reach the sport facility" is in accordance with economic theory.

To detect additional covariates we apply as well multiple regression analysis using DIFTIME as dependent variable and CTIME amongst several sociodemographic items as independent variable. Since a remarkable number of inquired consumers already reached their MWTIME their resulting DIFTIME measures zero. To solve this so called "censored sample" problem we apply Tobit regressions.

Regarding Cologne, all Top10 sports show a negative correlation between DIFTIME and CTIME with high significance ($p<.001$) in the case of bodybuilding (n=161; r=-.163), handball (n=344; r=-.192), running (n=555; r=-.125), soccer (n=1,057; r=-.114), tennis (n=311; r=-.165), track and field (n=111; r=-.275) and volleyball (n=232; r=-.197). Regarding Stuttgart, we could detect a highly significant ($p<.001$) negative correlation between DIFTIME and CTIME in the case of fitness (n=426; r=-

.177), soccer (n=348; r=-.194) and swimming (n=470; r=-.197) while there is no correlation for cycling, running and walking.

Tobit regressions reveal additional covariates like age, income, gender, household size, educational level, frequency and years of practicing sport with rather low explanatory power for the variance of DIFTIME.

Regarding the above derived empirical results we could state, that sport consumers' "willingness to spend time to reach the sport facility" is in accordance with economic theory. Hence leisure for sport activities seems to be subject to the concept of diminishing marginal utility. Therefore, sport managers have to take care with allocating sport facilities centrally. Anyway, to generate the appropriate efficiency maximizing allocation pattern they should take the sport specific travel time sensitivity and the sociodemographic status of their target group into account.

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