Appendix

Table. A.1 Input and output variables measurement

$$ENGINE^i = \left(\frac{POW^i{}_{ENG}}{CAP^i{}_{ENG}} \cdot \frac{TOR^i{}_{ENG}}{MASS^i} \right)^{\frac{1}{2}}$$

$POW^i{}_{ENG}$ = max engine power of car i, $TOR^i{}_{ENG}$ = max engine torque of car i, $CAP^i{}_{ENG}$ = engine capacity of car i, $MASS^i$ = mass of car i

All measurements are objective and available in trade technical literature. ENGINE^i was further normalized in the range [0, 1] by dividing its measurement by the maximum ENGINE value in sample.

$$MOBILITY^i = \left[\left(AC_1^i \cdot AC_2^i \cdot AC_3^i \cdot AC_4^i \cdot AC_5^i \cdot AC_6^i \right)^{\frac{1}{6}} \cdot \left(U_1^i \cdot U_2^i \cdot U_3^i \cdot U_4^i \right)^{\frac{1}{4}} \cdot V_{MAX}^i \right]^{\frac{1}{3}}$$

AC_1^i = acceleration of car i in the space [0 - 1 km], AC_2^i = acceleration of car i after 400 m,

AC_3^i = acceleration of car i to increase speed from 0 to 60 kmh, AC_4^i = acceleration of car i to increase speed from 0 to 80 kmh,

AC_5^i = acceleration of car i to increase speed from 0 to 100 kmh, AC_6^i = acceleration of car i to increase speed from 0 to 120 kmh,

U_1^i = pick up of car i to increase speed from 40 kmh, U_2^i = pick up of car i to increase speed from 70 to 80 kmh,

U_3^i = pick up of car i to increase speed from 70 to 100 kmh, U_4^i = pick up of car i to increase speed from 70 to 120 kmh,

U_4^i = pick up of car i to increase speed from 70 to 120 kmh, V_{MAX} = max speed of car i

All measurements are objective and available in trade technical literature. MOBILITY^i was further normalized in the range [0, 1] by dividing its measurement by the maximum MOBILITY value in sample.

$$SAFETY^i = \left[\left(BRAS^i \cdot BQ^i \right)^{\frac{1}{2}} \cdot \left(S_1^i \cdot S_2^i \cdot S_3^i \cdot S_4^i \right)^{\frac{1}{4}} \right]^{\frac{1}{2}}$$

$$BRAS^i = \frac{\frac{MASS^i}{MASS^{MAX}}}{\frac{\left(BS_1^i \cdot BS_2^i \cdot BS_3^i \right)^{\frac{1}{3}}}{BS^{MIN}}}$$

BQ^i = subjective measure of the braking quality of car i, $BRAS^i$ = braking space of car i, $MASS^i$ = mass of car i,

$MASS^{MAX}$ = maximum car mass in sample, BS_1^i = braking space of car i at speed of 60 kmh, BS_2^i = braking space of car i at speed of 80 kmh,

BS_3^i = braking space of car i at speed of 100 kmh, BS_3^i = braking space of car i at speed of 100 kmh,

BS^{MIN} = minimum $\left(BS_1^i \cdot BS_2^i \cdot BS_3^i \right)^{\frac{1}{3}}$ in sample, S_1^i = subjective measure of the steering quality of car i,

S_2^i = subjective measure of the visibility quality of car i, S_3^i = subjective measure of the road holding quality of car i,

S_4^i = subjective measure of the safety equipment quality of car i

All subjective measurements were provided by expert judgment by means of a 5 levels Likert type scale in the range [0, 1]. Objective were available in trade technical literature. SAFETY^i was further normalized in the range [0, 1] by dividing its measurement by the maximum SAFETY value in sample.

$$QUALITY^i = \left[\left(NO_1^i \cdot NO_2^i \cdot NO_3^i \cdot NO_4^i \right)^{\frac{1}{4}} \cdot \left(IQ_1^i \cdot IQ_2^i \cdot IQ_3^i \cdot IQ_4^i \cdot IQ_5^i \right)^{\frac{1}{5}} \cdot CO^i \right]^{\frac{1}{3}}$$

NO_1^i = internal noise level of car i at speed of 60 kmh, NO_2^i = internal noise level of car i at speed of 80 kmh,

NO_3^i = internal noise level of car i at speed of 100 kmh, NO_4^i = internal noise level of car i at speed of 120 kmh,

IQ_1^i = subjective measure of the car i internal fittings quality, IQ_2^i = subjective measure of the car i internal ventilation and climate quality,

IQ_3^i = subjective measure of the car i internal equipment quality, IQ_4^i = subjective measure of the car i internal space quality,

IQ_5^i = subjective measure of the car i driving seat quality, CO^i = subjective measure of the car i travel comfort quality

All subjective measurements were provided by expert judgment by means of a 5 levels Likert type scale in the range [0, 1]. Objective were available in trade technical literature. QUALITY^i was further normalized in the range [0, 1] by dividing its measurement by the maximum QUALITY value in sample.

$$PUC^i = \left(FU_1^i \cdot FU_2^i \cdot FU_3^i \right)^{\frac{1}{3}}$$

FU_1^i = fuel consumption of car i in city driving, FU_2^i = fuel consumption of car i at speed of 90 kmh,

FU_3^i = fuel consumption of car i at speed of 120 kmh

$$PPC_{1993}^i = \frac{CPI(1993)}{100} \cdot PPC_t^i$$

, PPC_{1993}^i = purchasing price of car i at year 1993, PPC_t^i = purchasing price of car i sold at year t