To: Prof. Liming

From: Kihong Kim

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Re: estimating destination choice models

1. estimate destination choices for only home-to-work trips

* not for work-to-home trips
* need to estimate models for other home-based trips

1. three data sources

* linked trip, person, and household files from ohas\_v2
* a zonal built environment file from lehd.taz2161
  + not sure who created this table
  + there are missing values for employment size information
* TAZ-to-TAZ impedance data from MetroSkims2010
  + some skim tables have been uploaded under the “metroskims2010” schema
  + only mf61 (shortest trip distance between TAZs)
  + using a “match” function, a TAZ-to-TAZ trip distance has been calculated for each TAZ alternative

1. choice set generation

* the universal choice set was defined as all TAZs in the linked-trip table
* select a subset (e.g., 9 TAZs) of nonchosen TAZs randomly from the universal choice set
* add the chosen TAZ to the subset
* randomize the order of alternatives in the choice set for each trip

1. model estimation

* for now, only a distance impedance variable was estimated
* what I failed ...
  + adding zonal built environment variables caused an error because of their missing values
  + in the context of destination choice models, I am not sure how to interpret the meaning of individual-specific variables, such as trip attributes (mode, time-of-day, etc.) and socioeconomic characteristics
* as expected, adding one impedance variable significantly increased the likelihood ratio values from -8494.236 to -5862.8
* here is the model result

> summary(m1)

Call:

mlogit(formula = f1, data = destination, method = "nr", print.level = 0)

Frequencies of alternatives:

1 2 3 4 5 6 7 8 9 10

0.100624 0.100081 0.101709 0.101980 0.097640 0.094657 0.103065 0.093301 0.106320 0.100624

nr method

5 iterations, 0h:0m:1s

g'(-H)^-1g = 1.45E-07

gradient close to zero

Coefficients :

Estimate Std. Error t-value Pr(>|t|)

dist -0.1997345 0.0035995 -55.49 < 2.2e-16 \*\*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Log-Likelihood: -5862.8