To: Prof. Liming Wang

From: Kihong Kim

Date: 11/22/2015

RE: Destination choice model estimation results

**# low-income home-based work trip purpose**

> summary(hbw.low.dc)

Call:

mlogit(formula = chosen ~ hbw\_logsum\_low + I(hbw\_logsum\_low^2) +

I(hbw\_logsum\_low^3) + TotEmp | 0 | 0, data = hbw.low.md,

method = "nr", print.level = 0)

Frequencies of alternatives:

1 2 3 4 5 6 7 8

0.112299 0.104278 0.117647 0.085561 0.104278 0.106952 0.082888 0.088235

9 10

0.098930 0.098930

nr method

6 iterations, 0h:0m:0s

g'(-H)^-1g = 0.000292

successive function values within tolerance limits

Coefficients :

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

hbw\_logsum\_low 2.8557e+00 4.6555e-01 6.1341 8.566e-10 \*\*\*

I(hbw\_logsum\_low^2) 5.5192e-01 2.3900e-01 2.3093 0.02093 \*

I(hbw\_logsum\_low^3) 4.3872e-02 3.4828e-02 1.2597 0.20779

TotEmp 3.7906e-04 3.7138e-05 10.2067 < 2.2e-16 \*\*\*

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

Log-Likelihood: -584.14

**# medium-income home-based work trip purpose**

> summary(hbw.med.dc)

Call:

mlogit(formula = chosen ~ hbw\_logsum\_med + I(hbw\_logsum\_med^2) +

I(hbw\_logsum\_med^3) + RetEmp + NonRet | 0 | 0, data = hbw.med.md,

method = "nr", print.level = 0)

Frequencies of alternatives:

1 2 3 4 5 6 7 8

0.095185 0.108623 0.103024 0.088466 0.092945 0.104143 0.105263 0.098544

9 10

0.089586 0.114222

nr method

6 iterations, 0h:0m:0s

g'(-H)^-1g = 1.21E-05

successive function values within tolerance limits

Coefficients :

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

hbw\_logsum\_med 2.9034e+00 3.4575e-01 8.3973 < 2.2e-16 \*\*\*

I(hbw\_logsum\_med^2) 5.6446e-01 1.8425e-01 3.0636 0.002187 \*\*

I(hbw\_logsum\_med^3) 4.6512e-02 2.7897e-02 1.6673 0.095460 .

RetEmp 9.4554e-04 1.1899e-04 7.9466 1.998e-15 \*\*\*

NonRet 4.1961e-04 2.9408e-05 14.2688 < 2.2e-16 \*\*\*

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

Log-Likelihood: -1373

**# high-income home-based work trip purpose**

> summary(hbw.high.dc)

Call:

mlogit(formula = chosen ~ hbw\_logsum\_high + I(hbw\_logsum\_high^2) +

I(hbw\_logsum\_high^3) + RetEmp + SvcEmp + FinEmp + NonRetSvcFin |

0 | 0, data = hbw.high.md, method = "nr", print.level = 0)

Frequencies of alternatives:

1 2 3 4 5 6 7 8

0.100694 0.097751 0.096069 0.104478 0.102375 0.098592 0.103637 0.104267

9 10

0.103427 0.088711

nr method

6 iterations, 0h:0m:1s

g'(-H)^-1g = 0.00284

successive function values within tolerance limits

Coefficients :

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

hbw\_logsum\_high 2.2866e+00 1.6179e-01 14.1333 < 2.2e-16 \*\*\*

I(hbw\_logsum\_high^2) 2.6693e-01 9.4237e-02 2.8325 0.004618 \*\*

I(hbw\_logsum\_high^3) 4.4841e-03 1.5939e-02 0.2813 0.778456

RetEmp 3.5987e-04 5.3963e-05 6.6689 2.578e-11 \*\*\*

SvcEmp 3.7869e-04 1.7289e-05 21.9036 < 2.2e-16 \*\*\*

FinEmp 1.0088e-03 6.0520e-05 16.6688 < 2.2e-16 \*\*\*

NonRetSvcFin 3.0293e-04 2.7345e-05 11.0778 < 2.2e-16 \*\*\*

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

Log-Likelihood: -7926.5

**# home-based shopping trip purpose**

> summary(hbs.dc)

Call:

mlogit(formula = chosen ~ hbs\_logsum\_avg + I(hbs\_logsum\_avg^2) +

I(hbs\_logsum\_avg^3) + RetEmp + NonRet + HHold | 0 | 0, data = hbs.md,

method = "nr", print.level = 0)

Frequencies of alternatives:

1 2 3 4 5 6 7 8

0.105263 0.101272 0.095286 0.103018 0.097032 0.100025 0.101023 0.096782

9 10

0.102270 0.098029

nr method

7 iterations, 0h:0m:0s

g'(-H)^-1g = 0.000408

successive function values within tolerance limits

Coefficients :

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

hbs\_logsum\_avg 5.9500e+00 1.2941e-01 45.9760 < 2.2e-16 \*\*\*

I(hbs\_logsum\_avg^2) -7.4537e-01 2.1013e-01 -3.5471 0.0003895 \*\*\*

I(hbs\_logsum\_avg^3) -7.9857e-01 7.6126e-02 -10.4901 < 2.2e-16 \*\*\*

RetEmp 1.4875e-03 8.7390e-05 17.0209 < 2.2e-16 \*\*\*

NonRet -5.0208e-05 3.5986e-05 -1.3952 0.1629549

HHold 7.2252e-04 5.6229e-05 12.8495 < 2.2e-16 \*\*\*

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

Log-Likelihood: -2831.1

**# home-based recreation trip purpose**

> summary(hbr.dc)

Call:

mlogit(formula = chosen ~ hbr\_logsum\_avg + I(hbr\_logsum\_avg^2) +

I(hbr\_logsum\_avg^3) + TotEmp + HHold + ParkAcres | 0 | 0,

data = hbr.md, method = "nr", print.level = 0)

Frequencies of alternatives:

1 2 3 4 5 6 7 8

0.103514 0.099082 0.097499 0.103514 0.093067 0.098765 0.102564 0.096233

9 10

0.105730 0.100032

nr method

8 iterations, 0h:0m:0s

g'(-H)^-1g = 2.29E-08

gradient close to zero

Coefficients :

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

hbr\_logsum\_avg 4.9399e+00 1.0240e-01 48.2400 < 2.2e-16 \*\*\*

I(hbr\_logsum\_avg^2) -2.1160e-01 8.2945e-02 -2.5511 0.01074 \*

I(hbr\_logsum\_avg^3) -6.0329e-01 5.0252e-02 -12.0054 < 2.2e-16 \*\*\*

TotEmp 1.8855e-04 2.3255e-05 8.1080 4.441e-16 \*\*\*

HHold 7.7135e-04 5.4823e-05 14.0698 < 2.2e-16 \*\*\*

ParkAcres 1.3583e-03 1.6203e-04 8.3827 < 2.2e-16 \*\*\*

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

Log-Likelihood: -2830.4

**# home-based non-school other trip purpose**

> summary(hbo.dc)

Call:

mlogit(formula = chosen ~ hbo\_logsum\_avg + I(hbo\_logsum\_avg^2) +

I(hbo\_logsum\_avg^3) + RetEmp + SvcEmp + GvtEmp + NonRetSvcGvt +

HHold | 0 | 0, data = hbo.md, method = "nr", print.level = 0)

Frequencies of alternatives:

1 2 3 4 5 6 7 8

0.099778 0.101713 0.098918 0.102143 0.097197 0.099491 0.102143 0.102072

9 10

0.098774 0.097771

nr method

6 iterations, 0h:0m:2s

g'(-H)^-1g = 6.69E-08

gradient close to zero

Coefficients :

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

hbo\_logsum\_avg 5.0847e+00 6.3890e-02 79.5857 < 2.2e-16 \*\*\*

I(hbo\_logsum\_avg^2) 2.2872e-01 9.9155e-02 2.3067 0.02107 \*

I(hbo\_logsum\_avg^3) -3.6371e-01 3.5114e-02 -10.3580 < 2.2e-16 \*\*\*

RetEmp 5.7298e-04 4.5616e-05 12.5608 < 2.2e-16 \*\*\*

SvcEmp 2.3770e-04 1.3778e-05 17.2523 < 2.2e-16 \*\*\*

GvtEmp 7.1294e-04 5.9325e-05 12.0176 < 2.2e-16 \*\*\*

NonRetSvcGvt 1.5495e-04 2.7703e-05 5.5932 2.229e-08 \*\*\*

HHold 7.8585e-04 2.6215e-05 29.9772 < 2.2e-16 \*\*\*

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

Log-Likelihood: -13350