

# Alternative Procedures for Estimating Random Coefficient Logit Demand Models

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20 data sets for each level of  $E[\beta_i^0]$  with  $T = 50$ ,  $J = 25$ ,  $\text{Var}[\beta_i] = [.5 \ .5 \ .5 \ .5 \ .2]$ ,  $\text{sigmaxi} = 1$ ,  $\text{nn} = 1331$ ,  $\text{seed} = 5500$ .

Five starting points in the estimation for each data set.

Conv: the number of converged cases over all trials (100)

CPU, Iter, FEVs: average major iterations, function evaluations over all trials (100)

GlobOpt: counts how many times a method find the global optimum (convergent cases)

FailsNr: counts the problems where a method do not find the best function value (convergent cases)

CPU-GOpt: an estimate of the computing time in seconds needed for obtaining the global minima

$E[\beta_i^0]$	$s_0$	Method	Conv	CPU(std)	GlobOpt	FailsNr	CPU-GOpt
-4	0.94	NumDerivSpectr	100	45(16)	71	0	251
		NumDerivSquar	100	53(18)	72	0	288
		BOBYQASpectr	100	43(18)	75	0	214
		BOBYQASquar	99	40(18)	75	0	199
		NelderMeadSpectr	100	104(54)	59	1	806
		NelderMeadContr	100	181(163)	59	1	1402
-2	0.86	NumDerivSpectr	100	50(17)	75	0	249
		NumDerivSquar	97	81(75)	71	0	452
		BOBYQASpectr	98	51(28)	71	0	285
		BOBYQASquar	100	44(24)	75	0	219
		NelderMeadSpectr	99	127(63)	53	2	1162
		NelderMeadContr	98	311(215)	52	2	2927
0	0.73	NumDerivSpectr	100	66(31)	80	0	283
		NumDerivSquar	94	98(60)	72	0	532
		BOBYQASpectr	94	69(28)	68	1	418
		BOBYQASquar	100	57(27)	74	0	292
		NelderMeadSpectr	96	169(81)	47	4	1839
		NelderMeadContr	85	584(290)	37	5	8731
2	0.54	NumDerivSpectr	94	96(41)	69	3	566
		NumDerivSquar	95	217(365)	67	2	1352
		BOBYQASpectr	84	110(54)	58	2	876
		BOBYQASquar	100	90(45)	66	4	576
		NelderMeadSpectr	86	286(137)	46	2	3206
		NelderMeadContr	31	916(180)	11	15	54298
4	0.34	NumDerivSpectr	94	211(118)	63	4	1466
		NumDerivSquar	93	542(619)	58	5	4316
		BOBYQASpectr	72	229(148)	57	4	1874
		BOBYQASquar	97	320(260)	66	4	2049
		NelderMeadSpectr	66	541(247)	32	5	9690
		NelderMeadContr	2	1001(41)	0	20	-Inf

Table 1: Results for different  $\beta_1$  values; 10 markets, 125 products; derivative-free outer loop.