Advanced Metrics

Problem Set 3: Indirect inference

Hans Martinez

03/20/21

The code and the report can be found in my github repo

MSLE (Probit)

For the first question, I used the `Nelder_Meade` routine in `simplex.f90`. For the second, I use `BFGS` and smooth the dependent variable as indicated in the assignment. For both questions, I used a recursive function instead of the traditional loop.

For the last question, I bootstrapped the data 100 times and used the unbiased bootstrap estimator. I used the Cholesky decomposition routine from Intel `LAPACK95` called `POTRI` to invert the matrix. I found that using intrinsic FORTRAN command `MATMUL`, when estimating Σ^{-1}, increases significantly the processing time when dealing with large matrices. I opted to use a `forall` command doing operations element by element, which significantly reduced time.

The results of the estimations are displayed in table 1. Table 2 displays the bootstrapped weight matrix. The difference between the estimators can not be observed in the table but the results to 16 digits are located in a file called `results.txt` in the github repo.

Table 1: Indirect inference Probit

	α	λ	γ
LPM	2.362687	0.02828675	-1.131293
NM Indicator	2.362687	0.02828673	-1.131293
BFGS Smooth	2.362687	0.02828675	-1.131293
NM Indicator WM	2.362687	0.02828676	-1.131293
BFGS Smooth WM	2.362687	0.02828677	-1.131293

Table 2: Bootstrapped weight matrix Σ^{-1}

353774.631	176861.134	602237.5
3532.956	117847.620	301053.9
12030.204	6013.818	1054542.9